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To help with entering graphics characters we have adopted a system of writing the characters for the ZX-81. We indicate inverse characters by the letter i and graphics by g, so that an inverse letter W is shown as iW and the graphics character on key 6 is denoted by g6.

Spaces are shown by sp and inverse spaces are isp. If some occur together, for instance a row of six spaces, they are shown by 6*sp and where there is a combination of characters each one is divided by a colon, thus sp:isp:6*g6 means a space followed by an inverse space and then six characters on the 6 key.

Where whole words are written in inverse letters they appear in the listings as lower-case letters.

In the Spectrum listings the characters are shown as they appear in a game with instructions included in the accompanying text.

D.K. electronics

ZX KEYBOARD FOR USE WITH /81 SPECTRUM

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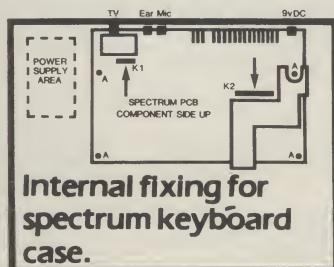
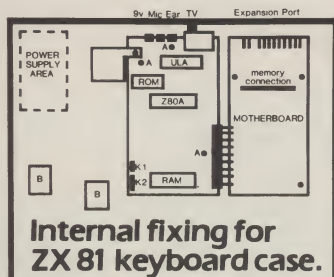
The case can be purchased separately with the keyboard aperture uncut, so if you have one of our early uncased keyboards, or in fact any other suppliers' keyboards, these could be fitted. The keyboard is connected to your computer by a ribbon cable and this has connectors fitted which simply push into the Sinclair connectors. It is a simple two minute job and requires no electronic skills. This keyboard does not need any soldering. Please specify on order whether you require the ZX 81 or Spectrum case.

SPECTRUM MODEL

This is supplied with spectrum legends, and a slightly different base for fitting the spectrum inside, again all the connectors are at the rear of the case and there is plenty of room for the power supply (and other add-ons). Should you want to change, we can supply both the Spectrum legends and details of updating your case which will enable modification from the ZX 81 to spectrum. PLEASE specify on your order whether you require the ZX 81 or spectrum case.

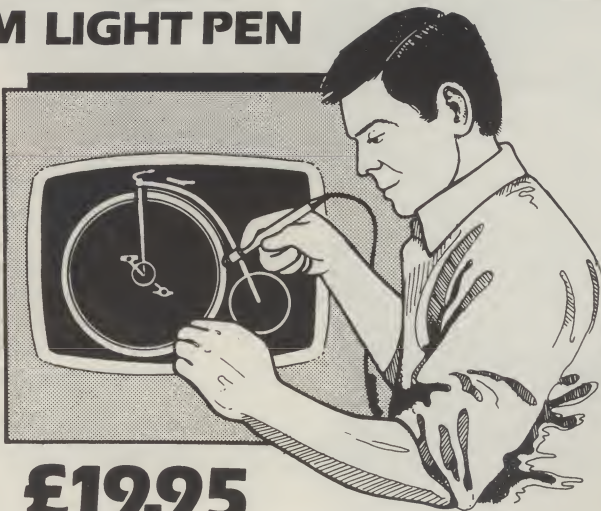


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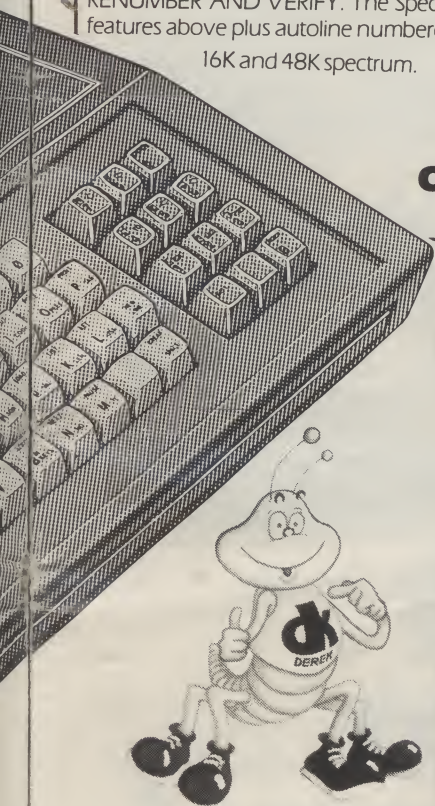
64K Memory Expansion
All the above information advantage lies in the 64K. 56K of usable memory. In the use of other add-ons. 8192-65536. The Block From Spectrum Memory Expansion. Upgrade your Spectrum to it is simply slipped inside the case are supplied, and the only time. The fitting requires the same as Sinclair's upgrade.

ZX 80~81 Spectrum HARDWARE

SPECTRUM/81 TOOLKIT

This is the toolkit which won acclaim in the feature in the August 1982 issue (pages 29 and 30) of Sinclair User. "It is the most impressive program, fast in execution with clear and full instructions...it stands out from the rest of the field." The ZXED is a powerful editor for use on the expanded ZX81. It is intended for use by the serious BASIC programmer and offers several useful and time saving features most helpful during all stages of program development. The facilities provided are as follows: ALTER, BYTES, COPY, DELETE, FIND, HELP, INSERT, KEEP, MOVE, RENUMBER AND VERIFY. The Spectrum Toolkit contains most of the features above plus autoline numberer and append, and will run in the 16K and 48K spectrum.

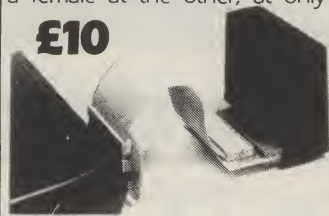
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Expansion £22.95

16K Dynamic Ram Chips. We use the dynamic as they are much denser than static and occupy less space. They are also much cheaper than the equivalent product. The Ram is manufactured with high quality materials, and uses high quality components. It is supplied ready-built and only needs to be plugged into the rear of the computer. All the components are fitted into holders. This massive add-on memory which is fully assembled and tested is the cheapest 16K memory available anywhere. (Same as the Sinclair memory.)

16K (UNCASED) £19.95

Expansion £52.95

Information on the 16K also applies to the 64K Memory Expansion, but the 64K giving nearly FOUR times the memory. This advanced model has 64K memory. In addition, the block from 8K to 16K can be switched out to enable the graphics ROM to be used in this area. Position in Memory: 16K Block From 8192-16384 is switchable.

64K (UNCASED) £49.95

Memory Expansion MK1 £35.00, MKII £30.00.

Expansion from 48K to 48K of user Ram. The Spectrum memory expansion is simple to fit, and only requires plugging in. Full fitting instructions are included. The only tool you will need is a screwdriver and just two minutes of your time. (The upgrade to 48K).

4K GRAPHICS ROM £24.95

The DK Graphic module is our latest ZX 81 accessory. This module unlike most other accessories fits neatly inside your computer under the keyboard. The module comes ready built, fully tested and complete with a 4K graphic ROM. This will give you an unbelievable 448 extra pre-programmed graphics, your normal graphic set contains only 64. This means that you now have 512 graphics and with their inverse 1024. This now turns the 81 into a very powerful computer with a graphic set rarely found on larger more expensive machines. In the ROM are lower case letters, bombs, bullets, rockets, tanks, a complete set of invaders graphics and that only accounts for about 50 of them, there are still about 400 left (that may give you an idea as to the scope of the new ROM). However, the module does not finish there, it also has a spare holder on the board which will accept a further 4K of ROM/RAM. This holder can be fitted with a 1K/2K/RAM and can be used for user definable graphics so you can create your own custom character sets.

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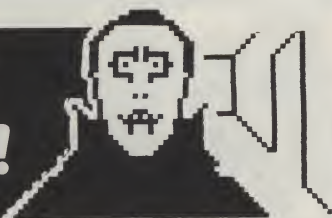
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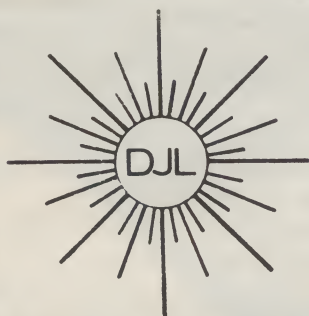
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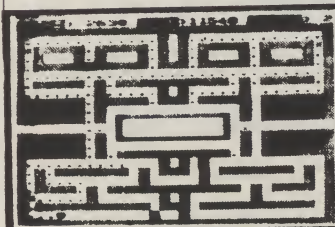


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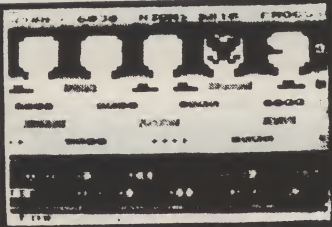
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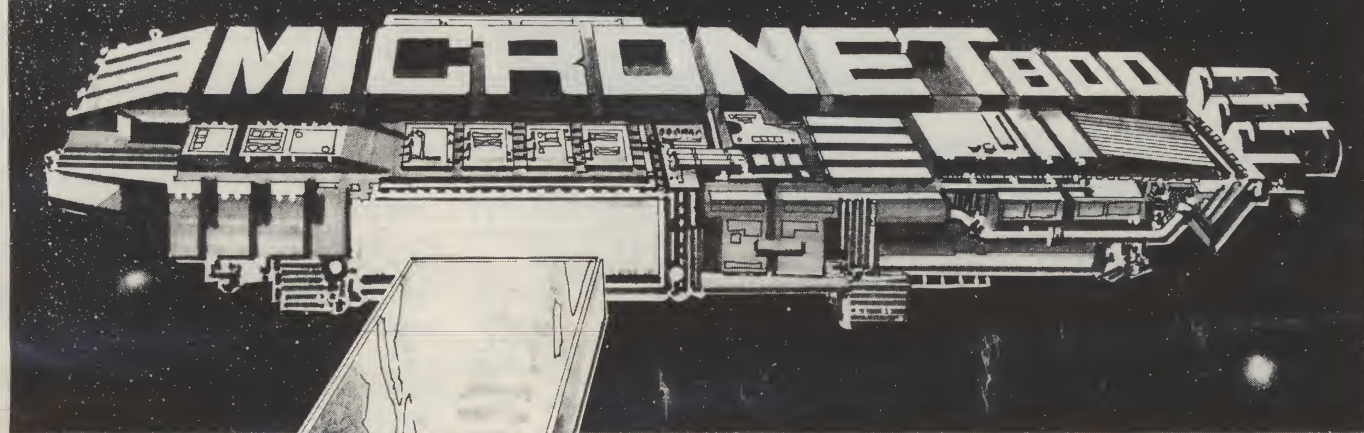
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SIMON is based on the popular electronic game. It produces random collections of colours and sounds for the player to repeat. A block of colour appears on the screen with the colour number and a corresponding tone. Type-in the numbers which the computer has produced, remembering to type 'ENTER' between each one. The amount of numbers to be remembered and repeated rises steadily from 1 to 30.

The program was written for the 16K Spectrum by D Rushton and J Jones of Biggin Hill, Kent.

SIMON SAYS

```

2 PAPER 7: BORDER 5: INK 2:
3 PRINT AT 1,1;" @ Justin Jon
es Productions"
5 PRINT AT 3,1;" @ Darren Rus
hton Productions"
6 PRINT AT 4,1;"
7 PRINT AT 5,1;"
8 PRINT AT 9,1;"***SIMON SIMO
N SIMON SIMON SIMON SIMON SIMON
SIMON SIMON SIMON SIMON SIMON SI
MON SIMON SIMON***": PAUSE 100
10 DIM f(30): DIM a(30)
15 PAPER 7: INK 0: BORDER 7: C
LS
20 FOR i=1 TO 30: LET f(i)=INT
(RND*8): NEXT i
30 FOR n=1 TO 30
40 INPUT "Press*ENTER*when*you
*are*ready": LINE Z$
50 FOR c=1 TO n
60 LET cn=f(c): GO SUB 300
80 CLS: NEXT c
90 FOR c=1 TO n
100 INPUT ("What*was*colour*num
ber*":c;"?"):a(c)
110 IF a(c)<>INT a(c) OR a(c)<0

```

```

THEN INPUT "Between*0**7.**Re-
enter*":a(c): GO TO 110
120 LET cn=a(c): GO SUB 300
130 IF a(c)<>f(c) THEN BEEP 2,-
20: GO TO 180
140 NEXT c
150 INPUT (" You've done*":n;"*
correctly*****":c)*to*continu
e*or*(s)*to*stop?(c/s)"): LINE Z
$: IF Z$="s" THEN STOP
160 NEXT n
170 PRINT AT 15,0;"Well*done*Y
ou've*beaten*me."
180 PRINT AT 16,0;"The*sequence
*was*:"
187 PAUSE 150
190 IF n>30 THEN LET n=30
200 FOR i=1 TO n: PRINT BRIGHT
1: PAPER f(i): INK 9:f(i): BEEP
0.5,f(i)*5-20: NEXT i
210 STOP
300 FOR i=6 TO 9: PRINT AT i,11
: BRIGHT 1: PAPER cn;"****": NEX
T i
305 PLOT 88,127: DRAW 0,-31: DR
AW 31,0: DRAW 0,31: DRAW -31,0
310 PRINT AT 6,14: INK 9:cn: BE
EP 1,cn*5-20
320 RETURN

```


ATTACKED

IN LONE ORBIT over Earth, you are suddenly surrounded by the invading Virgulons. You throw yourself fearlessly forward, determined to die defending all that is dearest.

The alien hordes will attempt to ram you until your force shield is destroyed but you are equipped with Earth's latest weapon, the deadly destabiliser ray. Manoeuvre left with 5, right with 8, and fire with Z.

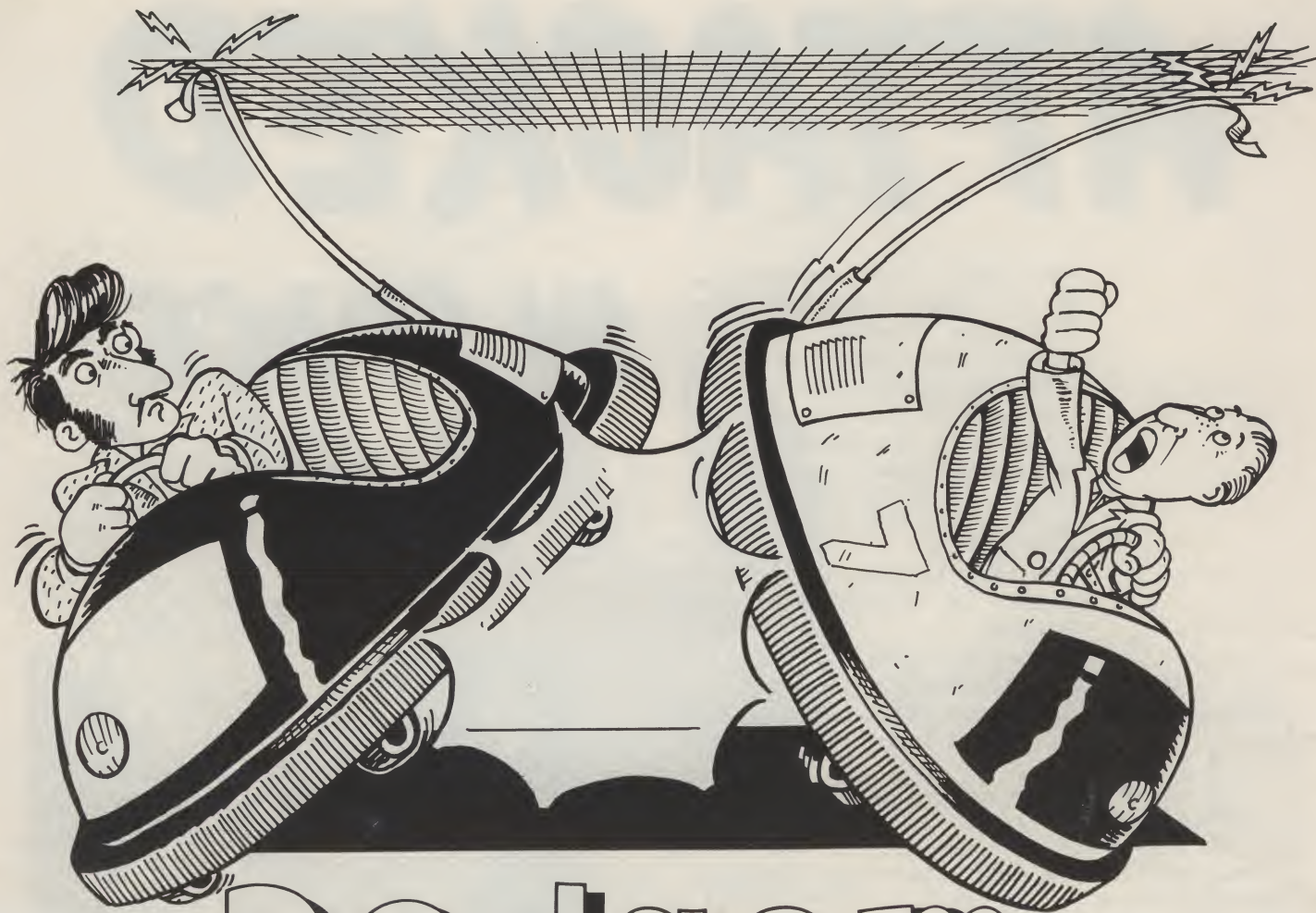
Attacked in Space was sent by S McElroy of Wolverhampton, West Midlands.

Lower-case letters in brackets are graphics instructions. (1KZX-81).

IN SPACE

```
10 LET P=5
15 POKE 16418,14
20 LET D=P-P
25 LET T=0
50 LET P=P+(INKEY$="M")-(INKEY
$="N")
52 IF INKEY$="Z" THEN GOTO 200
53 LET T=T+(P=P)
55 SCROLL
56 IF P<P-P THEN LET P=P-P
57 IF P>8 THEN LET P=P-P
60 PRINT AT P-P,P;
70 IF T=100 OR PEEK (PEEK 1639
8+PEEK 16499*256)=CODE "(inverse
QUOTATION MARK)" THEN GOTO 300
80 PRINT "(inverse V)"
85 PRINT AT 9,RND*8;"(inverse
QUOTATION MARK)"
90 GOTO 50
200 FOR X=1 TO 9
210 PRINT AT X,P;
220 LET N=PEEK (PEEK 16398+PEEK
16399*256)
230 PRINT "."
240 IF N=CODE "(inverse QUOTATI
ON MARK)" THEN GOTO 270
250 NEXT X
255 LET D=D-X
260 GOTO 50
270 LET D=D+X
280 GOTO 50
300 PRINT AT 5,0;"(three INVERS
E SPACES)";D;"(three INVERSE SPA
CES)"
305 PRINT
310 PAUSE 4E4
320 CLS
330 RUN
```





Dodgem

DODGE the coloured squares and avoid crossing your own trail. A familiar game but extremely well-written. Colourful graphics and fast-moving characters are all

packed into around 2K of memory. The speed is so fast that on its highest level it defeated its author.

It is one of a batch of excellent

programs for the 16K or 48K Spectrum which were written by P D Loach of Hadleigh, Suffolk. Try this program—it is very impressive.

```

5 LET hs=365: GO SUB 2000
10 INK 0: PAPER 6: BORDER 1: C
15 INPUT "DIFFICULTY (1 TO 6-E
ASIEST)";d: IF d<1 OR d>6 OR d>I
NT d THEN BEEP 1,0: GO TO 10
20 LET t=0: LET l=5: LET q=d+5
: LET d=d/100: FOR f=0 TO 31: PR
INT AT 0,f: INK 3;"■":AT 21,f:"■
": IF f<22 THEN PRINT INK 3;AT f
,0;"■":AT f,31;"■"
30 NEXT f: FOR f=1 TO 45: PRIN
T PAPER RND*3+1,AT RND*19+1,RND*
29+1;" ": NEXT f: PRINT PAPER 3:
INK 7;AT 0,16;"HIGH ";hs
40 BEEP 1,0: LET a=1: LET b=0:
LET x=15: LET y=10: FOR f=9 TO
13: PRINT AT f,14;" ": NEXT f
50 LET i$=INKEY$: IF i$>"4" AN
D i$<"9" THEN LET a=(i$="6")-(i$
="7"): LET b=(i$="8")-(i$="5"):
BEEP .005,x
60 PRINT AT 0,0: INK 7: PAPER
3;"TIME ";t
70 FOR f=1 TO q: NEXT f
80 BEEP d,x: LET t=t+1: LET y=
y+a: LET x=x+b: LET c=ATTR (y,x)
: PRINT AT y,x;"A";AT y-a,x-b;"
": IF c=48 THEN GO TO 50
100 LET du=.005: FOR f=1 TO 20:
BEEP du,f: LET du=du+.003: NEXT
f
110 LET l=l-1: PRINT PAPER 3;AT
y,x;" ":AT 21,0: PAPER 3: INK 7
:"LIVES ";l: IF l THEN GO TO 100

```

```

120 PRINT #0: FLASH 1: INK 2: P
APER 6;"YOU ARE OUT OF LIVES": I
F t>hs THEN PRINT AT 21,0: FLASH
1: PAPER 3: INK 7;"HIGH SCORE":
LET hs=t
130 IF INKEY$<>"" THEN GO TO 13
0
140 IF INKEY$="" THEN GO TO 140
150 GO TO 10
1000 PRINT AT 21,16: FLASH 1: IN
K 2: PAPER 6;"HA,HA!": FOR y=1
TO 20: PRINT AT y,1: PAPER 8: IN
K 0;TAB 31: NEXT y: FOR y=1 TO
15: PRINT AT RND*19+1,RND*29+1:
PAPER RND*5;" ": NEXT y
1010 PRINT AT 21,16: PAPER 3;"
": GO TO 40
2000 RESTORE: FOR f=USR "p" TO
USR "p"+7: READ a: POKE f,VAL ("
BIN "+STR$ a): NEXT f: DATA 1100
0,3,111100,1011010,1011000,10010
0,3,0
2010 BORDER 0: PAPER 0: INK 6: C
LS
2020 PRINT TAB 9;"DODGEMS"" Yo
u (A) must dodge your way thr
ough the maze,avoiding all obs
tacles & you mustn't cross you
r path."" Move using the curso
r keys."
2030 IF INKEY$<>"" THEN GO TO 20
30
2040 IF INKEY$="" THEN GO TO 204
0
2050 RETURN

```



```

10 PRINT "ENTER THE LENGTH OF
THE LONGEST WORD"
20 INPUT LEN
30 PRINT "ENTER THE AMOUNT OF
WORDS"
40 INPUT WORDS
50 PRINT "NOW ENTER THE WORDS"
55 PRINT "ENTER "C" IF THE W
ORD IS      INCORRECT"
60 DIM B$(WORDS,LEN)
70 FOR Q=1 TO WORDS
75 PRINT AT 7,0;"WORD ";Q
80 INPUT B$(Q)
85 PRINT AT 8,15-(INT (LEN/2))
;B$(Q)
90 IF B$(Q,1 TO 2)="C " THEN G
OTO 107
100 NEXT Q
101 PRINT "SET THE TAPE RECORDER
READY TO RECORD AND PRESS NEW
LINE."
102 INPUT I$
103 CLS
104 SAVE "ANAGRAMS"
105 GOTO 110
107 LET Q=Q-1
108 PRINT AT 7,5;Q
109 GOTO 80
110 LET COR=0
111 FOR B=1 TO 10
115 FAST
120 RAND
130 CLS
140 LET W=INT (RND*WORDS)+1
150 LET A#=B$(W)
160 FOR M=1 TO LEN A#
170 IF A$(M)=" " THEN GOTO 190
180 NEXT M
190 LET A#=A$(1 TO M-1)
200 RAND
210 LET F#=""
220 DIM A(LEN A#)
230 FOR N=1 TO LEN A#
240 LET R=INT (RND*LEN A#)+1
250 LET A(N)=R
260 FOR C=1 TO N
270 FOR D=1 TO N
280 IF C=D THEN GOTO 300
290 IF A(C)=A(D) THEN GOTO 240
300 NEXT D
310 NEXT C
320 LET F#=F#+A$(R)
330 IF A#=F# THEN GOTO 230
340 IF LEN A#=LEN F# THEN GOTO
360
350 NEXT N
360 SLOW
370 PRINT AT 8,11;"ANAGRAMS"
380 PRINT TAB 11;""
390 PRINT
400 LET D#="HERE IS ANAGRAM NO.
"+STR$ B

```



ANAGRAMS

CHALLENGE YOURSELF and challenge your friends with the scrambled words produced by **Anagram**. It will mix the letters in any words you enter and print them out in an unrecognisable form for you to guess the original word.

The program for the 16K ZX-81 was written by S R Woodward of Leigh-on-Sea, Essex.

```

405 PRINT TAB 15-INT (LEN D#/2)
;D#
406 PRINT ,,TAB (15-INT (LEN F#
/2));F#
410 LET GOES=INT (LEN F#/2)
420 LET Z#=""
430 PRINT
450 LET AN=1
460 PRINT AT 8,0;"YOU HAVE ";GO
ES;(" GOES" AND GOES<>1);(" GO"
AND GOES=1);" TO GUESS IT. "
470 FOR Q=1 TO 5
480 PRINT AT 8,9;" ";AT 8,9;GOE
S
485 NEXT Q

```



```

490 PRINT "WHAT DO YOU THINK TH
E ";("FIRST " AND AN=1);("NEXT "
AND AN<>1);"LETTER IS? "
495 PRINT ", "OR DO YOU KNOW THE
WHOLE WORD?"
500 IF A$=Z$ THEN GOTO 2000
510 INPUT G$
531 IF LEN G$>1 AND G$=A$(AN TO
LEN A$) THEN LET Z$=Z$+G$
532 IF LEN G$=1 AND G$=A$(AN) T
HEN LET Z$=Z$+G$
535 IF G$=A$ THEN GOTO 2000
540 IF G$<>A$(AN TO LEN A$) AND
G$<>A$(AN) THEN GOTO 600
550 IF G$=A$(AN TO LEN A$) OR G
$=A$(AN) THEN GOSUB 840
556 IF Z$=A$ THEN GOTO 2000
560 PRINT
570 PRINT AT 16,3;A$(1 TO LEN Z
$)
580 LET AN=AN+1
590 GOTO 460
600 FOR E=1 TO 10
610 PRINT AT 19,10;"WRONG"
620 PRINT AT 19,10;"wrong"
630 NEXT E
640 PRINT AT 19,10;" "
650 LET GOES=GOES-1
660 IF GOES=0 THEN GOTO 680
670 GOTO 460
680 FOR E=1 TO 20
690 NEXT E
700 CLS
710 PRINT "YOU HAVE FAILED IN G
UESSING";,TAB 11;"THE WORD."
720 PRINT
730 PRINT TAB 12;"IT WAS"
740 PRINT
750 LET Z$=""
760 FOR E=1 TO LEN A$
770 LET Z$=Z$+CHR$(CODE A$(E)+
128)
780 NEXT E
790 FOR E=1 TO 10
795 LET EN=16-(INT (LEN A$/2))-
1
800 PRINT AT 7,EN;A$;AT 7,EN;Z$
810 NEXT E
820 PRINT AT 7,EN;A$
821 FOR E=1 TO 20
822 NEXT E
830 GOTO 950
840 FOR E=1 TO 10
850 PRINT AT 14,9;"CORRECT";AT
14,9;"correct"
860 NEXT E
870 PRINT AT 14,9;" "
880 RETURN
890 PRINT AT 16,3;A$
895 FOR E=1 TO 30
900 NEXT E
910 CLS
920 PRINT AT 0,4;"YOU GUESSED T
HE WORD IN"

```

```

930 LET EN=(INT (LEN A$/2)-GOES
)+1
940 PRINT ,TAB 12;EN;" ";("GOES
" AND EN<>1);("GO" AND EN=1)
945 IF GOES<>0 THEN LET COR=COR
+1
946 FOR E=1 TO 30
947 NEXT E
950 NEXT B
954 PRINT AT 9,0;" YOU GOT
";COR;(" ANAGRAM" AND COR=1);("
ANAGRAMS" AND COR<>1);TAB 5;" CO
RRECT OUT OF ";B-1
955 PRINT AT 12,0;"DO YOU WANT
TO HAVE ANOTHER GO?"
960 INPUT I$
970 IF I$(1)="Y" THEN GOTO 110
980 PRINT
990 PRINT "DO YOU WANT TO CHANG
E THE WORDS?"
1000 INPUT I$
1010 IF I$(1)="N" THEN STOP
1020 CLS
1030 RUN
2000 LET K$=""
"
2010 PRINT AT 21,0;A$
2020 PRINT AT 21,0;K$
2030 PRINT AT 20,0;A$
2040 PRINT AT 20,0;K$
2050 PRINT AT 19,1;A$
2060 PRINT AT 19,1;K$
2070 PRINT AT 18,1;A$;AT 18,1;K$
2080 PRINT AT 17,2;A$;AT 17,2;K$
2090 PRINT AT 16,3;A$
2100 GOTO 890
5000 FOR N=1 TO WORDS
5010 SCROLL
5020 PRINT B$(N);TAB 16;N
5030 NEXT N

```



ROMEO stands on a see-saw, trying to leap to the balcony above. You stand on the opposite building and drop down a weight between 1 and 14 which will land at the other end of the see-saw and send him shooting up to the balcony. If you pick the wrong weight he will travel too far, or fall short, and be smashed to a pulp.

The program was written for the 16K Spectrum by M Green of Maidstone, Kent.

Use graphic 'A' in lines 15, 40 and 46; graphic 'B' in line 18; graphic 'C' in line 23; graphic 'D' in line 240 and graphic 'E' in lines 60 and 210.

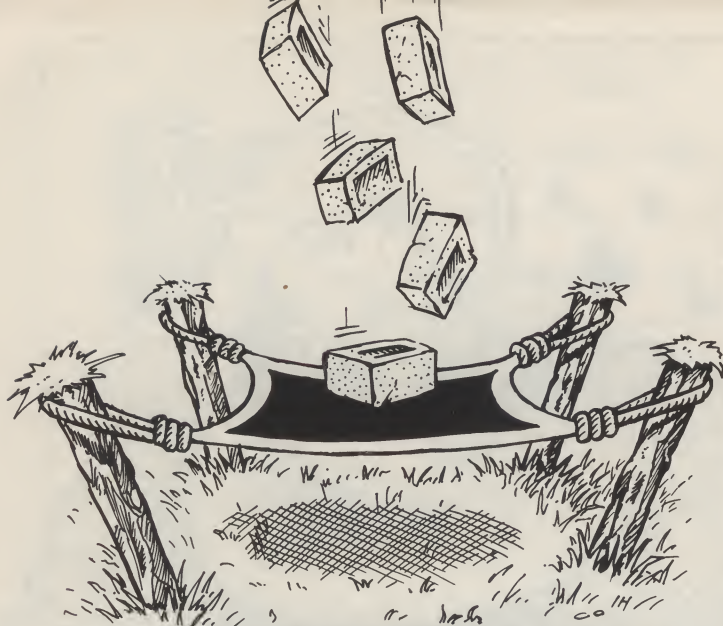
```

1 PAPER 0: INK 7: BORDER 0: C
LS
2 DATA 55,55,146,254,16,124,6
3,198
3 DATA 0,255,171,171,171,171,
255,255
4 DATA 0,0,28,20,62,62,127,12
7
5 DATA 0,0,0,0,24,126,255,255
6 DATA 192,224,224,240,240,22
4,224,192
7 FOR n=144 TO 148
8 FOR f=0 TO 7: READ 3: POKE
USR CHR$ n+f,3: NEXT f
9 NEXT n
10 PRINT AT 4,0: INK 6;"■■■■■"
11 AT 5,0:"■■■■■":AT 6,0:"■■■■■"
11 FOR n=7 TO 21: PRINT AT n,1
: INK 6;"■■■■■": NEXT n
12 PRINT AT 11,13: INK 4;"■■■■■"
:AT 12,15;"■■■■■":AT 13,15;"■■■■■":AT 14
:15:"■■■■■":AT 18,15;"■■■■■":AT 19,15;"■■■■■"
:AT 20,15;"■■■■■":AT 21,15;"■■■■■"
13 FOR n=11 TO 21: PRINT AT n,
16: INK 4;"■■■■■": NE
XT n
14 LET x=21: LET y=8: PRINT AT
21,10:"O": PLOT 64,0: DRAW 37,1
6
15 PRINT AT x,y: INK 5;"A"
17 LET h=INT (RND*11)+8
18 PRINT AT h+1,6:"■"
20 PRINT AT 4,11:"ENTER WEIGHT
":AT 5,13:"(max.14)"
22 INPUT w: IF w<=0 OR w>=15 T
HEN GO TO 22
23 FOR n=10 TO 20: PRINT AT n-
1,12:" ":AT n,12:"A": BEEP .1,n:
NEXT n
30 PLOT 64,0: DRAW OVER 1,37,1
6: PLOT 64,16: DRAW 37,-16
35 FOR n=1 TO w
36 LET x=x-1
40 PRINT AT x,y:"A":AT x+1,y:"
"
45 NEXT n
46 FOR n=1 TO 2: LET y=y-1: PR
INT AT x,y:"A": NEXT n
50 IF x=h THEN GO TO 100
55 IF x>h THEN GO TO 200
60 IF x<h THEN PRINT AT x,y:
INK 5;"A": BEEP 1,-10: STOP
100 PRINT AT x,y+1:"WELL DONE!"
110 FOR n=0 TO 40 STEP 10: BEEP
.1,n: NEXT n
120 CLS
130 RUN
200 FOR n=x TO 21
210 PRINT AT n,y: INK 5;"■■■■■":AT
n-1,y:" "
220 BEEP .05,n
230 NEXT n
240 PRINT AT 21,y: INK 5;"■■■■■"
250 BEEP 1,-10
300 STOP

```



SAVE ROMEO



HEAVENS ABOVE!

EAGER USERS of ZX-81 must sometimes be overcome with the belief that someone up there does not like them. Each new program brings a new peril from the skies, missiles, bombers, alien invaders. This program is no exception. You are represented by a black square in the

centre of the screen and bricks rain down from the skies on you. The aim is not to dodge them but to catch them, which you do by means of the cursor keys 5 and 8. If the bricks reach the ground and pile up to your height you are defeated and the game ends.

The game was written for the 16K

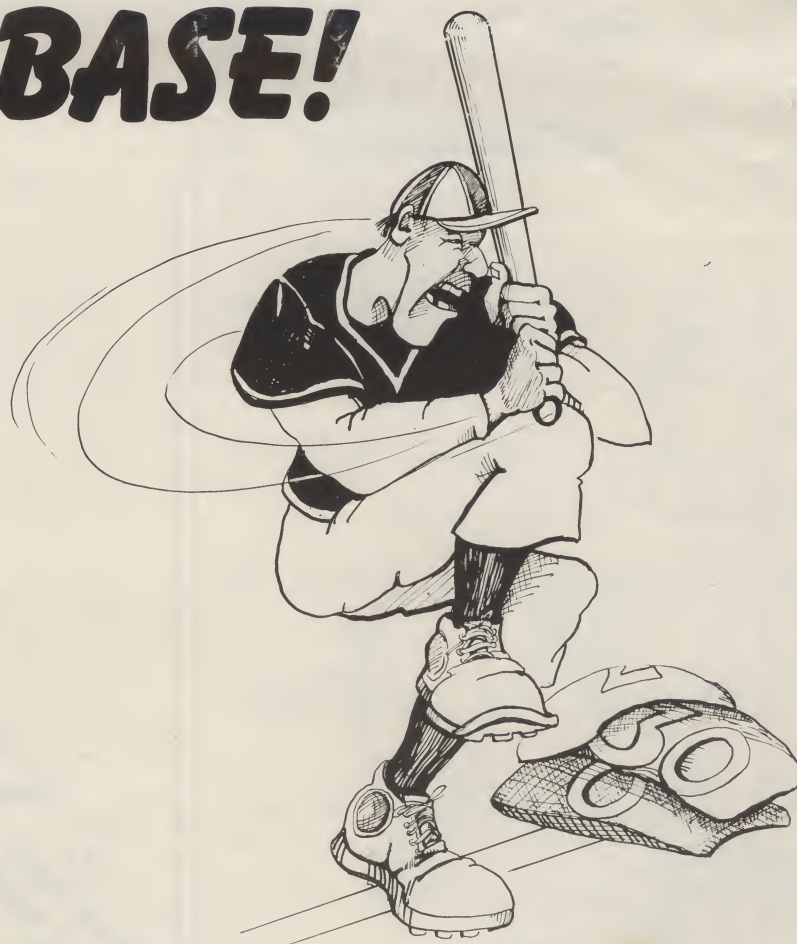
```
10 LET H=11
30 DIM A(4)
40 LET P=INT (4*RND)+1
60 LET J=5*P
70 FOR I=8 TO 21-A(P)
80 PRINT AT I,J;"(gh)"
81 PRINT AT I-1,J;" "
90 LET M$=INKEY$
100 IF M$="5" THEN LET H=H-1
110 IF M$="8" THEN LET H=H+1
115~PRINT AT 15,H;"(sp:2*isp:sp
)"
120 IF I=15 AND ABS (H+2-J)<=1
THEN GOTO 40
125 NEXT I
130 LET A(P)=A(P)+1
135 IF A(P)=7 THEN STOP
140 GOTO 40
```

ZX-81 by Richard Copper of Warley, West Midlands.

Graphics instructions are given in lower-case letters in brackets. A space is represented by 'sp', an inverse space by 'isp', and a graphic H by 'gh'.

```
90 PRINT "INPUT THE NUMBER AND
"
100 PRINT "THEN ITS BASE:(2-35)
"
110 INPUT A$
120 INPUT B1
130 LET N=0
140 FOR Z=LEN A$-1 TO 0 STEP -1
150 LET N=N+((B1**Z)*(CODE (A$(
LEN A$-Z))-28))
160 NEXT Z
170~PRINT "WHICH BASE DO YOU WA
NT IT"
180 PRINT "CONVERTED TO?"
190 INPUT B2
200 LET N$=""
210 LET R=N-INT (N/B2)*B2
215 LET N=INT (N/B2)
220 LET N$=N$+CHR$(R+28)
230 IF N<>0 THEN GOTO 210
240 CLS
250 PRINT A$;" IN BASE ";B1
260 PRINT "IS EQUAL TO "
270 FOR Z=LEN N$ TO 1 STEP -1
280 PRINT N$(Z);
290 NEXT Z
300 PRINT " IN BASE";B2
310 PRINT
320 PRINT "ANOTHER GO?"
330 INPUT A$
340 IF A$="Y" THEN RUN
350 IF A$<>"N" THEN GOTO 330
```

BASE!

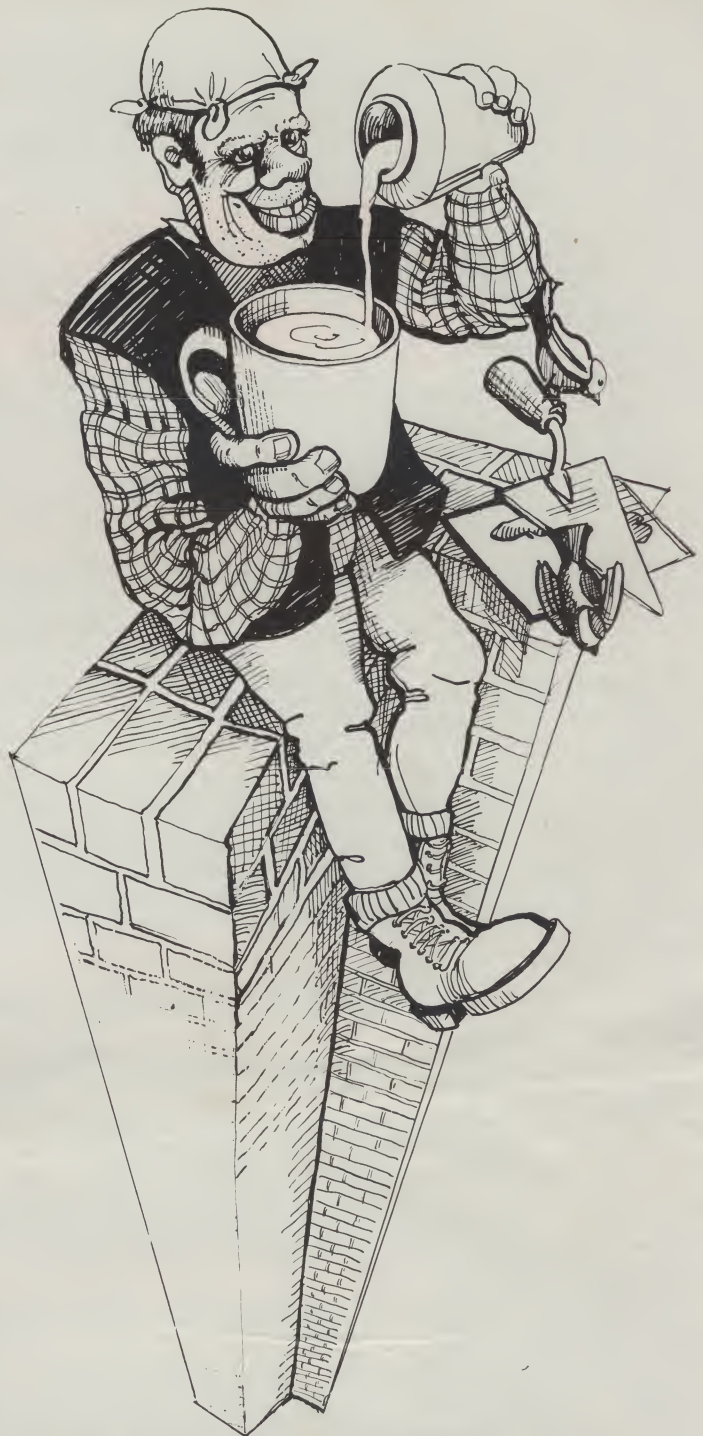


A USEFUL routine for converting a number to the same number in any **Base** between 2 and 35. Ideal for people who have been struggling with binary. The program was written by David Wells of Sidcup, Kent for the 1K ZX-81.


```

1 REM BRICKY S.J. REDMAN
4 FOR a=0 TO 7: READ r: POKE
USR "a"+8,r: NEXT a
5 DATA 126,126,126,0,231,231,
231,0
10 INK 7: PAPER 1: BORDER 1: C
LS
12 LET s=0: LET o=0
20 PRINT AT 0,10;"BRICKY"
30 PRINT "You are a bricklayer
building a wall on the screen."
40 PRINT "A rival bricklayer is a
lso on site building his wall."
41 PRINT "The first person to
crash into a wall will lose."
50 PRINT "You control the dir
ection that you move in by:-"
60 PRINT "Q" up "Z" down "I"
left "P" right
65 PRINT "Your wall is colour
ed green. INK 4;"
66 PRINT "The SPECTRUM has a y
ellow wall. INK 6;"
68 PRINT TAB 20; FLASH 1;"PRES
S A KEY"
70 PAUSE 0. CLS: PRINT "Beware
a deep black hole. If you fall
down one you lose 5 points."
80 PRINT "If you can force th
e SPECTRUM down one you score
5 points."
90 INPUT "PRESS ENTER FOR A GO
ME": LINE US
100 PRINT AT 0,0: FOR r=1 TO 2
2: PRINT "NEXT r"
120 LET a=8: LET b=8
130 LET c=12: LET d=22
140 LET p=INT (RND*20+1): LET q
=INT (RND*30+1): IF p=8 OR p=12
THEN GO TO 140
150 PRINT AT p,q: PAPER 0:
160 POKE 23560,112
170 LET c3=SGN (RND-.5)
180 LET d3=SGN (RND-.5)
190 LET c1=c3*(RND<.5)
200 LET d1=d3*(c1=0)
2000 LET l=PEEK 23560
2040 IF l=105 THEN LET b=b-1+32*
(b=0)
2050 IF l=112 THEN LET b=b+1-32*
(b=31)
2070 IF l=122 THEN LET a=a+1-22*
(a=21)
2080 IF l=113 THEN LET a=a-1+22*
(a=0)
2110 IF SCREEN$ (a,b)("<") THEN
GO TO 5100
2120 PRINT AT a,b: INK 4;"█": AT
c,d: INK 6;"█"
2130 LET dd=d: LET cc=c
2140 IF RND>.9 THEN GO TO 4000
2150 LET c=c+c1: LET d=d+d1
2160 GO SUB 6000
2170 IF SCREEN$ (c,d)("<") THEN
GO TO 4000
2190 GO TO 2000
4000 LET c2=c1: LET d2=d1
4100 LET c1=c3*(c1=0): LET d1=d3
*(d1=0)
4110 LET c=cc+c1: LET d=dd+d1
4120 LET c=c+22*((c<0)-(c>21))
4130 LET d=d+32*((d<0)-(d>31))
4150 IF SCREEN$ (c,d)("<") THEN G
O TO 2000
4510 LET c=cc-c1: LET d=dd-d1
4520 LET c=c+22*((c<0)-(c>21))
4530 LET d=d+32*((d<0)-(d>31))
4550 IF SCREEN$ (c,d)("<") THEN L
ET c1=-c1: LET d1=-d1: LET c3=c1
+c2: LET d3=d1+d2: GO TO 2000
5000 LET c1=c2: LET d1=d2
5010 LET c=cc+c1: LET d=dd+d1
5020 GO SUB 6000
5050 IF SCREEN$ (c,d)("<") THEN G
O TO 2000
5060 GO TO 7000
5100 IF ATTR (a,b)=7 THEN BEEP
3,-10: BEEP .4,-20: LET s=s+5: G
O TO 5120
5110 PRINT AT a,b: FLASH 1;"#<
5120 LET s=s+1
5130 FOR r=20 TO -20 STEP -1: B
EEP .01,r: NEXT r
6000 PRINT AT 0,0: INK 0: PAPER
7:" YOU ";o:" SPECTRUM ";s:"
GO TO 90
7000 LET o=o+1
7010 IF (p=cc OR q=dd) AND (ABS
(dd-q)=1 OR ABS (cc-p)=1) THEN L
ET o=o+4: BEEP .3,0. BEEP .4,0:
GO TO 7040
7020 PRINT AT c,d: FLASH 1;"#<
7040 FOR r=-20 TO 20: BEEP .01,r
: NEXT r
7050 GO TO 6000
8000 LET c=c+22*((c<0)-(c>21))
8010 LET d=d+32*((d<0)-(d>31))
8020 RETURN

```



BRICKY

YOU ARE a bricklayer, erecting a green wall. The computer plays the part of another bricklayer, producing a yellow wall. The first player to bump into a wall loses the round. An added complication is the appearance of black muddy holes on the screen. If you walk into one of them you lose five points but if you can force the computer into one you score five points.

Move up using "Q", move down by using "Z", move left by using "I", and move right by using "P".

This fast-moving game was written for the 16K or 48K Spectrum by Stephen Redman of Sunderland, Tyne and Wear.

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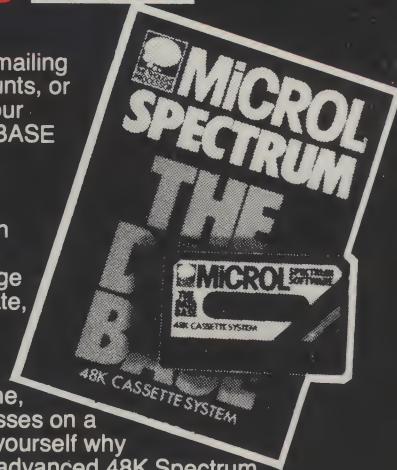
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ADDRESS


```

1 LET A=CODE ""
2 LET B=CODE "-"
3 LET D=B
4 LET C=D
5 INPUT H
50 LET D=D+(CODE "<92)" AND D<
CODE "C" AND INKEY$="5")-(CODE "
<92)" AND D>CODE "" AND INKEY$="
8")
51 LET D=D+(INKEY$="7")-(INKEY
$="6")
52 LET B=B+(INKEY$="7")-(INKEY
$="6")
60 LET B=B+(CODE "<92)" AND B<
CODE "C" AND INKEY$="8")-(CODE "
<92)" AND B>CODE "" AND INKEY$="
5")
70 LET H=H-(B AND B>D)-(D AND
D>B)-(B AND B=D)+CODE "-"
71 PRINT AT CODE "",CODE "";"(
95:isp)altCft";H;"(98)"
72 IF H<CODE "2" THEN PRINT "
(95)at runway(98)"
73~IF H=CODE "" AND B=CODE "-"
AND B=D THEN PRINT AT CODE "(91
)",0;"(G5) landed (98) ";Q
74 IF H<CODE "" THEN PRINT "(9
5:isp)c
74 IF H<CODE "" THEN PRINT "(9
5:isp)crashed(15:98)";Q
100 LET X=C-A
110 LET Y=D-B
120 IF ABS Y>=ABS X THEN GOTO C
ODE "e"
130 FOR N=A TO C STEP SGN X
140 PLOT N,B+Y/X*(N-A)
141 PRINT AT CODE "(95)",4;"-+-
"
150 NEXT N
160 GOTO CODE "ABS "
170 FOR N=B TO D STEP SGN Y
180 PLOT A+X/Y*(N-B),N
181 PRINT AT CODE "(95)",4;"-+-
"
190 NEXT N
210 CLS
220 GOTO CODE ">"

```



Pilot

PILOT is an aircraft simulation program for the unexpanded ZX-81, written by Mark Powell of Thurmaston, Leicestershire. Before the game begins you must key-in your height in feet above the ground. By using cursor keys 5, 6, 7 and 8 you can change your position in relation to the horizon.

When you fall to 30 feet or below, you will be warned that you are above the runway and you must level your flight to land, as you cannot land while banking. When a height of 0 is shown use key 6 so that you stall and land on the runway. If you land too quickly or at an angle you will crash.



CODES may be used to code any message comprising the characters with codes from 0 to 63. To input the program, two pre-arranged numbers are used. The first, INPUT A, takes any value from 2 to 27 and the second, INPUT B, any value from 1 to 65535.

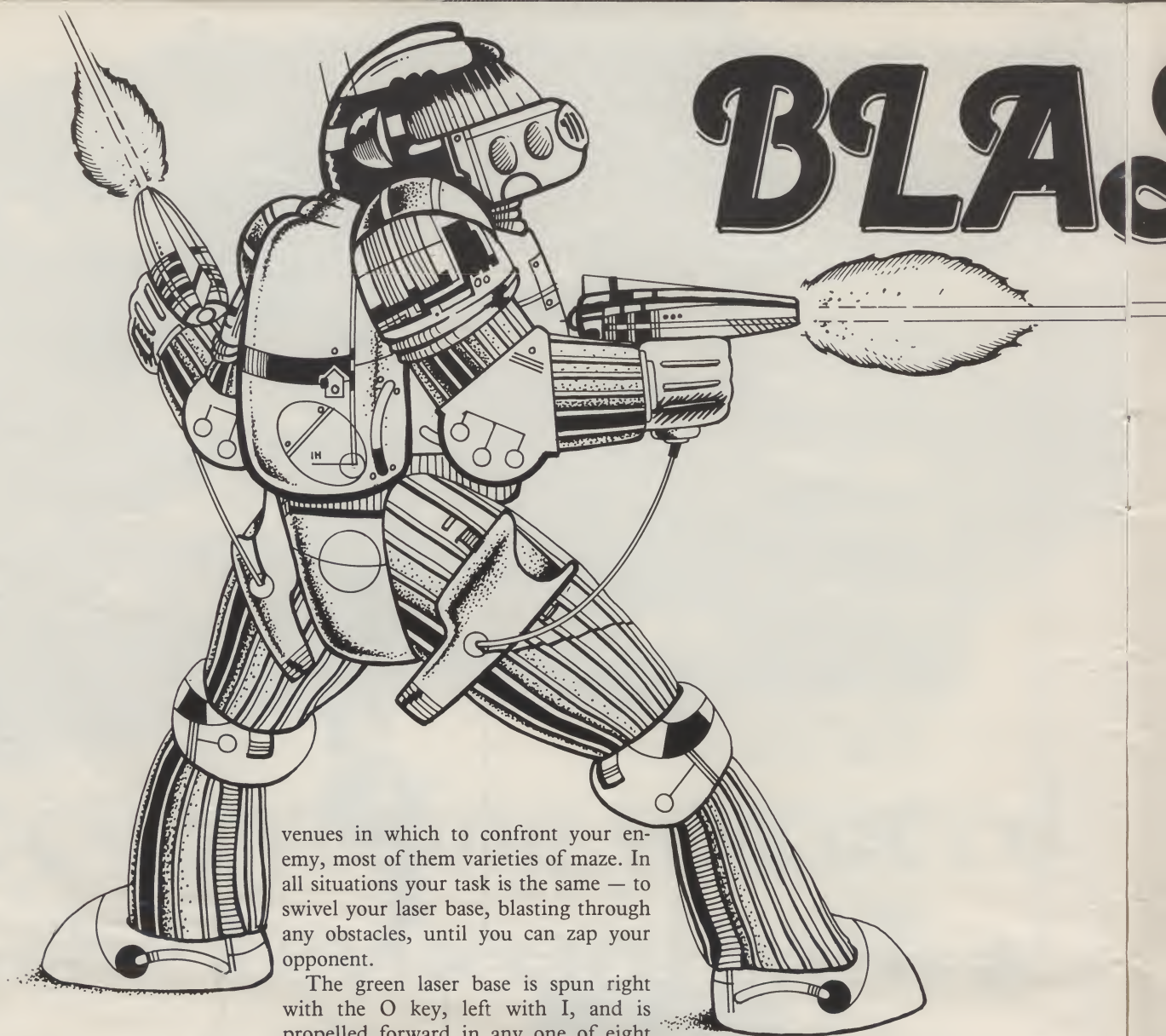
The program should prove invaluable to any international spy network equipped with ZX-81 computers. It was written for the 16K ZX-81 by R Hopley of Liverpool.

CODES

```

10 REM "CODE "
20 FAST
30 LET D=CODE "(91)"
40 PRINT " INPUT A(2 TO 27)"
50 INPUT A
60 PRINT " INPUT B(1 TO 65535)
"
70 INPUT B
80 PRINT " INPUT C(1 TO CODE O
R 2 TO DECODE)"
90 INPUT C
100 LET C$=""
110 PRINT "TYPE IN YOUR MESSAGE
"
120 INPUT A$
130 CLS
140 RAND B
150 FOR Q=D TO LEN A$ STEP C
160 IF C=D THEN LET B$=STR$(CO
DE "(95)" + INT (RND*A) + CODE A$(Q)
)
170 IF C=CODE "(92)" THEN LET B
$=CHR$(VAL A$(Q TO Q+D)-INT (RN
D*A)-CODE "(95)")
180 LET C$=C$+B$
190 NEXT Q
200 PRINT C$

```

TWO PLAYERS are required for **Blaster**, an unusual, fight-to-the-death maze game from Stephen Culley of Lowdham, Nottinghamshire.

At the beginning of the program you are presented with a choice of six

venues in which to confront your enemy, most of them varieties of maze. In all situations your task is the same — to swivel your laser base, blasting through any obstacles, until you can zap your opponent.

The green laser base is spun right with the O key, left with I, and is propelled forward in any one of eight directions with P. Its laser is fired with U. Player red goes forward with A, spins right with S, left with D and fires with F. The various positions of the two characters, bearing an uncanny resemblance to the Clockman figure in our November/December issue, are shown in line 30 where they should be entered by graphic A to H.

Maze choice number three, incident-

tally, gives the user the opportunity to create his own maze. To exercise that option, manoeuvre the flashing cross with the cursor keys and input 0 to leave a block. Press ENTER when the maze is complete. (48K Spectrum).

```

10 GO SUB 8000: GO SUB 8100
20 DEF FN R(R)=INT (RAND*R)+1:
30 DIM X(4): DIM Y(4): DIM P(2)
40 DIM S$(22,32): LET A$="A-H"
35 GO SUB 8200
40 FOR N=1 TO 2: LET P(N)=FN R
(8)
41 LET X(N)=FN R(30)+1: LET Y(
N)=FN R(20)+1: IF S$(Y(N),X(N))<
>" " THEN GO TO 41
42 NEXT N
45 LET PLAY=1: LET X1=0: LET Y
1=0
50 LET P1=(NOT (PLAY-1))+1
60 LET KEY=IN 65022: IF PLAY=2
THEN LET KEY=IN 57342
70 GO SUB 500: PRINT AT Y(PLAY)
-1,X(PLAY)-1: INK (PLAY*2);A$(P
(PLAY))
80 BEEP .01,(PLAY*10)
85 IF X(PLAY)=X(P1) AND Y(PLAY)
=Y(P1) THEN GO TO 860
90 LET PLAY=(NOT (PLAY-1))+1
100 GO TO 50
300 REM THRUST
310 IF S$(Y(PLAY)+Y1,X(PLAY)+X1)
<>" " THEN RETURN

```

```

320 PRINT AT Y(PLAY)-1,X(PLAY)-
1:" "
330 LET X(PLAY)=X(PLAY)+X1: LET
Y(PLAY)=Y(PLAY)+Y1: PRINT AT Y(
PLAY)-1,X(PLAY)-1: INK 5;A$(P(PL
AY)): BEEP .01,50: RETURN
500 REM CHECK KEY'S
510 IF KEY=255 THEN RETURN
520 IF KEY=254 THEN GO SUB 900:
GO SUB 300: RETURN
530 IF KEY=253 THEN LET P(PLAY)
=P(PLAY)+1: IF P(PLAY)>8 THEN LE
T P(PLAY)=1: RETURN
540 IF KEY=251 THEN LET P(PLAY)
=P(PLAY)-1: IF P(PLAY)<1 THEN LE
T P(PLAY)=8: RETURN
550 IF KEY<>247 THEN RETURN
560 REM FIRE
570 GO SUB 900
580 FOR N=1 TO 10: IF S$(Y(PLAY)
+Y1,X(PLAY)+X1)="" THEN THE
N IF Y(PLAY)+Y1<Y(P1) OR X(
PLAY)+X1<X(P1) THEN NEXT N
581 PLOT INK PLAY*2;(X(PLAY)*8-
4)+(4*X1),175-((Y(PLAY)*8-4)+(4*
Y1)): DRAW INK PLAY*2;X1*((N-1)*
8)-(Y1*((N-1)*8)): BEEP .01,0
582 PLOT OVER 1;(X(PLAY)*8-4)+(

```


BLASTER!

```

4=X1),175-(Y(PLAY)+8-4)+(4*Y1))
: DRAW OVER 1;X1=((N-1)*8),-(Y1*
(N-1)*8): BEEP .01,0
590 IF X(PLAY)+(X1*N)=X(P1) AND
Y(PLAY)+(Y1*N)=Y(P1) THEN GO TO
800
595 IF (Y(PLAY)+(Y1*N))>1 THEN
IF Y(PLAY)+(Y1*N)<22 THEN IF X(P
LAY)+(X1*N)>1 THEN IF X(PLAY)+(X
1*N)<32 THEN LET S$(Y(PLAY)+(Y1*
N),X(PLAY)+(X1*N))=" ": PRINT AT
Y(PLAY)+(Y1*N)-1,X(PLAY)+(X1*N)
-1," "
600 BEEP .01,-20: RETURN
800 REM HIT
810 FOR N=0 TO 7: BORDER N: BEE
P .2,(N*10)-10: NEXT N
820 PRINT INK 0; PAPER 7; FLASH
1;AT 11,5;" PLAYER ";PLAY;" IS
THE WINNER ";AT 12,5;"
";AT 10,5;"

830 PRINT INK I; PAPER P;AT 21,
1;" PRESS ANY KEY TO PLAY AGAIN.

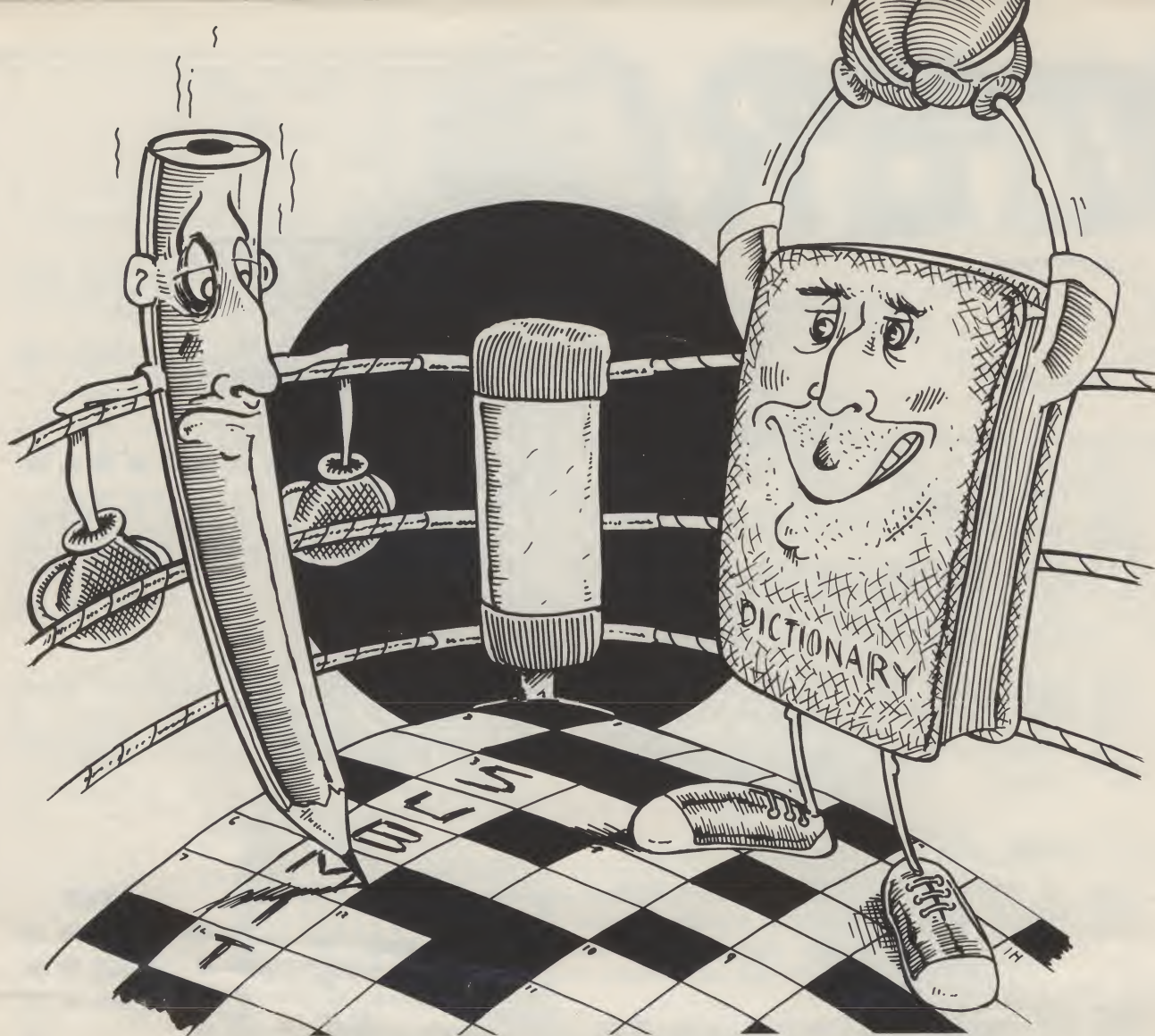
840 IF INKEY$="" THEN GO TO 840
850 GO TO 20
870 PRINT INK 0; PAPER 7; FLASH
1;AT 10,5;"
";AT 11
,5;" COLLISION ";AT 12,5;"
";FLASH 0;AT 21,0;"PRE
SS ANY KEY TO PLAY"
880 BEEP .5,-10
890 IF INKEY$="" THEN GO TO 890
895 GO TO 20
900 REM FIND DIRECTION
905 LET Y1=0: LET X1=0
910 IF P(PLAY)=1 OR P(PLAY)=2 O
R P(PLAY)=8 THEN LET Y1=-1
920 IF P(PLAY)=2 OR P(PLAY)=3 O
R P(PLAY)=4 THEN LET X1=1
930 IF P(PLAY)=4 OR P(PLAY)=5 O
R P(PLAY)=6 THEN LET Y1=+1
940 IF P(PLAY)=6 OR P(PLAY)=7 O
R P(PLAY)=8 THEN LET X1=-1
950 BEEP .001,0
960 IF X(PLAY)+X1>32 OR X(PLAY)
+X1<1 THEN LET X1=0
970 IF Y(PLAY)+Y1>22 OR Y(PLAY)
+Y1<1 THEN LET Y1=0
980 RETURN
8000 REM CHARACTERS
8010 FOR N=1 TO 8: READ A$: FOR
M=0 TO 7: READ A: POKE USR A$+M,
A: NEXT M: NEXT N
8020 DATA "A",BIN 00011000,BIN 0
0011000,BIN 00100100,BIN 0010010
0,BIN 01000010,BIN 01011010,BIN
10100101,BIN 11000011
8030 DATA "B",3,BIN 00001101,BIN
00110010,BIN 11000010,BIN 00110
100,BIN 00010100,8,8
8040 DATA "C",BIN 11000000,BIN 1
0110000,BIN 01001100,BIN 00100001
1,BIN 001000011,BIN 01001100,BIN
10110000,BIN 11000000
8050 DATA "D",8,8,BIN 00010100,8
IN 00110100,BIN 11000010,BIN 001
10010,BIN 00001101,3
8060 DATA "E",BIN 110000011,BIN 1
0100101,BIN 01011010,BIN 01000001
0,BIN 00100100,BIN 00100100,BIN
00011000,BIN 00011000
8070 DATA "F",BIN 00010000,BIN 0
0010000,BIN 00101000,BIN 0010110
0,BIN 01000011,BIN 01001100,BIN
10110000,BIN 11000000
8080 DATA "G",3,BIN 00001101,BIN
00110010,BIN 11000100,BIN 11000
100,BIN 00110010,BIN 00001101,3
8090 DATA "H",BIN 11000000,BIN 1
0110000,BIN 01001100,BIN 01000001

```

```

1,BIN 0010110,BIN 00101000,BIN 0
0010000,BIN 00010000
8095 RETURN
8100 REM INSTRUCTIONS
8190 RETURN
8200 REM GAME SELECT
8210 PAPER 7: INK 0: BORDER 7: C
LS
8220 PRINT AT 0,7;"GAME SELECT."
;AT 1,7;"
8240 PRINT ""1)Maze Blaster ""
"3)Star Strike""3)Draw own maz
e.""4)Space Wars""5)Random M
aze""6)Random choice (Games 1-
5)"
8250 INPUT ("Choice "); LINE C$
8260 IF C$="6" OR C$="1" THEN BE
EP .5,-40: GO TO 8250
8270 LET C=VAL C$: IF C<>INT C T
HEN GO TO 8250
8280 IF C=2 THEN LET I=5: LET P=
7: FOR N=1 TO 22 STEP 2: LET S$(
N)=" ": NEXT N
8300 IF C=6 THEN LET C=FN R(5):
GO TO 8280 AND C<>3: GO TO 8300
8310 IF C=5 THEN LET P=7: LET I=
0: FOR N=1 TO 100+FN R(100): LET
S$(FN R(22),FN R(32))=" ": NEXT
N
8320 IF C<>1 AND C<>3 THEN GO TO
8900
8330 IF C=1 THEN GO TO 8500
8340 LET X=1: LET Y=1: CLS
8350 PRINT AT Y-1,X-1;S$(Y,X)
8360 IF INKEY$="0" THEN LET S$(Y
,X)=" ": GO TO 8380
8370 LET X=X+(INKEY$="8" AND X<3
2)-(INKEY$="5" AND X>1): LET Y=Y
+(INKEY$="6" AND Y<22)-(INKEY$="
7" AND Y>1)
8380 PRINT AT Y-1,X-1; INK 2;"X"
: IF INKEY$=CHR$ 13 THEN LET I=0
: LET P=0: GO TO 8900
8390 GO TO 8350
8500 REM Maze #1
8505 LET P=7: LET I=1
8510 LET S$(2)=" "
8520 LET S$(3)=" "
8530 LET S$(4)=" "
8540 LET S$(5)=" "
8550 LET S$(6)=" "
8560 LET S$(7)=" "
8570 LET S$(8)=" "
8580 LET S$(9)=" "
8590 LET S$(10)=" "
8600 LET S$(11)=" "
8610 LET S$(12)=" "
8620 LET S$(13)=" "
8630 LET S$(14)=" "
8640 LET S$(15)=" "
8650 LET S$(16)=" "
8660 LET S$(17)=" "
8670 LET S$(18)=" "
8680 LET S$(19)=" "
8690 LET S$(20)=" "
8700 LET S$(21)=" "
8900 REM PRINTOUT SCREEN
8910 FOR N=1 TO 22: LET S$(N,1)=
" ": LET S$(N,32)=" ": NEXT N: F
OR N=1 TO 32: LET S$(1,N)=" ": L
ET S$(22,N)=" ": NEXT N
8915 IF C=4 THEN LET P=0: PAPER
0: LET I=7: BORDER 0
8920 CLS
8955 IF C=4 THEN PRINT #0; INK 7
;"@ STEPHEN CULLEY": RETURN
8960 INK I: PAPER P: BORDER P
8960 FOR N=1 TO 22: PRINT AT N-1
,0;S$(N): NEXT N: PRINT #0; INK
9;"@ STEPHEN CULLEY"
8970 RETURN
8980 CLEAR : SAVE CHR$ 18+CHR$ 1
+"Blaster." LINE 10

```

CROSSWORD

ROISIN MULLAN of Newry, County Down has written **Crossword** for those owners of a 16K ZX-81 who take time away from their computers to solve puzzles.

Enter the known letters of a word in their respective places and then either the alphabet or the vowels can be rotated through the blank spaces. When the correct letter has been found, 'H' will

hold that letter in place and you can go to the next space.

The author says that her family has already saved a fortune in paper by using the program.

```

1 PRINT AT 10,10;"*****"
20 PRINT AT 12,10;"1234567890"
30 PRINT AT 16,10;"crossword"
40 PRINT AT 17,13;"aid"
50 PRINT AT 0,0;"DO YOU KNOW A
NY LETTERS?"
60 PRINT
70 PRINT "IF YOU DO "
75 PRINT "PUT IN EACH LETTER A
ND THEN ENTER ITS POSITION"
80 PRINT
90 PRINT "E.G. E1 PUTS E FIRST
IN THE WORDTHERE IS NO LIMIT TO
THE NO OF WORDS YOU CAN PUT IN
"
100 INPUT C$
110 LET B=LEN C$
120 FOR I=2 TO B STEP 2
130 LET E=VAL C$(I)
140 LET E#=C$(I-1)
145 IF E=0 THEN LET E=10
150 PRINT AT 10,(E+9);E$
155 NEXT I
187 GOSUB 1600
190 PRINT AT 0,0;"1 ENTER MORE
LETTERS."

```

```

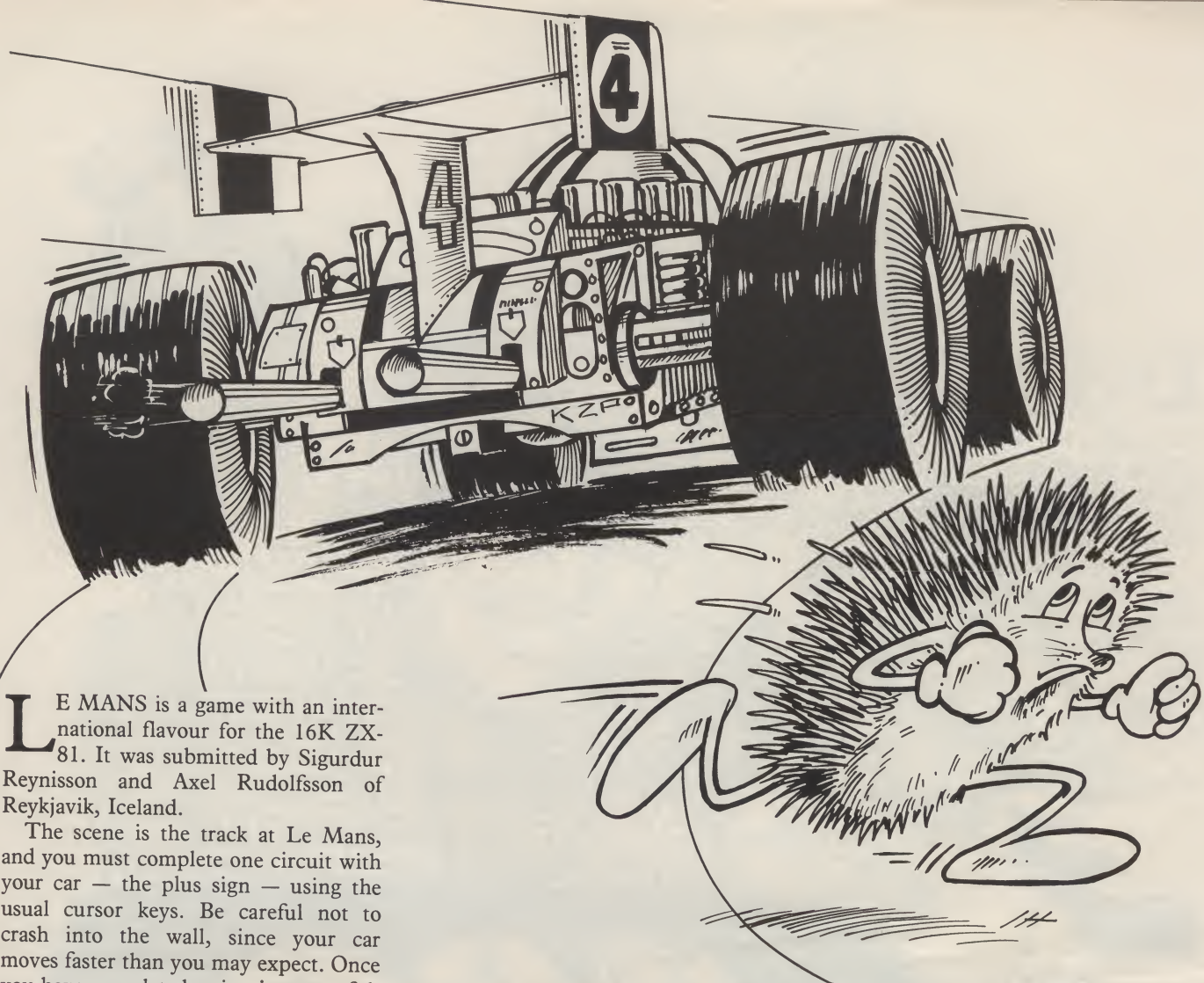
200 PRINT
210 PRINT "2 ROTATE VOWELS"
220 PRINT
230 PRINT "3 ROTATE WHOLE ALPHA
BET"
240 PRINT
250 PRINT "ENTER THE NUMBER OF
YOUR CHOICE"
260 INPUT A$
265 LET A=VAL A$
270 IF A=1 THEN PRINT AT 0,0;"
"
274 IF A=2 THEN GOTO 300
277 IF A=3 THEN GOTO 400
280 GOSUB 1600
290 GOTO 75
300 GOSUB 1600
310 PRINT "WHAT PLACE SHALL I R
OTATE?"
320 INPUT D$
330 LET D=(VAL D$+9)
340 LET A#="AEIOU*"
350 FOR N=1 TO 6
353 FOR I=1 TO 25
354 IF INKEY#="H" THEN GOTO 187
357 NEXT I

```

```

360 PRINT AT 10,D;A$(N)
370 NEXT N
380 GOTO 187
400 LET M$="ABCDEFGHIJKLMNOPQRSTUVWXYZ
TUVWXYZ*"
401 GOSUB 1600
402 PRINT "WHICH PLACE SHALL I
ROTATE?"
403 INPUT A$
404 LET A=VAL A$
405 GOSUB 1600
410 FOR I=1 TO LEN M$
420 FOR K=1 TO 15
425 LET D=9+A
430 PRINT AT 10,D;M$(I)
440 IF INKEY#="H" THEN GOTO 187
450 NEXT K
460 NEXT I
470 GOTO 187
1600 FOR V=0 TO 9
1700 PRINT AT V,0;"
"
1800 NEXT V
1850 PRINT AT 0,0;"
"
1900 RETURN

```

LE MANS is a game with an international flavour for the 16K ZX-81. It was submitted by Sigurdur Reynisson and Axel Rudolfsson of Reykjavik, Iceland.

The scene is the track at Le Mans, and you must complete one circuit with your car — the plus sign — using the usual cursor keys. Be careful not to crash into the wall, since your car moves faster than you may expect. Once you have completed a circuit successfully your time in seconds will be displayed. The fastest time achieved by the program writers was 16.31 seconds.

Lower-case letters in brackets are graphics instructions.

LE MANS

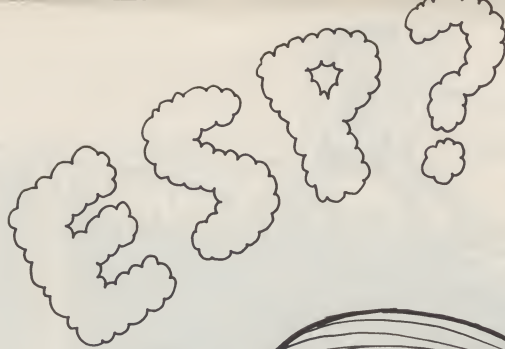
```

10 REM      LE MANS
20 REM      AXEL AND SIGGI
30 REM      MADE THE PROGRAM
50 CLS
70 PRINT "*****"
80 PRINT "*****LE*****"
90 PRINT "*****MANS*****"
100 PRINT "*****"
110 PRINT "*****"
120 PRINT "*****"
130 PRINT "*****"
140 PRINT "*****"
150 PRINT "*****"
160 PRINT "*****"
170 PRINT "*****"
180 PRINT "*****"
190 PRINT "*****"
200 PRINT "*****"
210 PRINT "*****"

*****
220 PRINT "**"
*****
230 PRINT "**"
*****
240 PRINT "*"
<<<<graph
ic a)
250 PRINT "**"
<graph
ic a)
260 PRINT "***"
<<<<graph
ic a)
270 PRINT "*****"
*****
274 PRINT "      HIT ANY KE
Y"
280 IF INKEY#="" THEN GOTO 280
285 PRINT AT 21,0;"
"
290 LET A=18954
300 LET T=0
310 LET A1=A
350 IF INKEY#=CHR#(33) THEN LE
T A=A-1
360 IF INKEY#=CHR#(34) THEN LE
T A=A+33
370 IF INKEY#=CHR#(35) THEN LE
T A=A-33
380 IF INKEY#=CHR#(36) THEN LE
T A=A+1
390 IF PEEK A=23 THEN GOTO 600
400 IF PEEK A=136 THEN GOTO 500
410 POKE A1,0
420 LET A1=A

430 POKE A,21
440 LET T=T+.151
450 GOTO 350
500 CLS
505 IF T<15 THEN GOTO 1000
512 LET T=INT (T*100+.5)/100
515 PRINT AT 12,4;"YOUR TIME ,
" T;" SEC."
520 GOTO 800
600 POKE A1,0
610 FOR F=0 TO 10
620 POKE A,21
630 POKE A,149
640 NEXT F
650 FOR F=1 TO 10
670 POKE A,1
680 POKE A,2
690 POKE A,135
700 POKE A,4
710 NEXT F
720 POKE A,149
800 PRINT AT 18,6;"(write in in
verse letters WANT TO TRY AGAIN?
)"
810 IF INKEY#="Y" THEN GOTO 50
820 IF INKEY#="N" THEN GOTO 150
0
830 GOTO 810
1000 PRINT AT 16,2;"WHO ARE YOU
TRYING TO CHEAT"
1010 GOTO 800
1500 CLS
1510 STOP

```

DO YOU WANT to know if you can see the future?

Andrew Macgregor of Rainhill, Merseyside, sent **ESP**, an irresistible routine for testing your pre-cognitive abilities. Five abstract symbols are displayed and you are invited to decide which will be selected.

You have 25 attempts and could expect, on a strictly statistical basis, a success rate of 20 percent, that is five. Any variation from that figure is significant.

Everyone in the office seems strictly first-sighted but we feel sure that some of our readers will prove to be paranormal. (16K Spectrum).



```

8 INVERSE 1: INK 4: PRINT AT
1,0;" THE E.S.P TEST WAS INVENTE
D BY PROF. J.B.RHINE IN 1934": I
NK 0: INVERSE 0
10 LET z=0
20 FOR t=1 TO 25
30 LET rp=INT (6*AND): IF rp=0
THEN GO TO 30
32 PRINT AT 6,6;CHR$ 144;AT 6,
10;CHR$ 145;AT 6,14;CHR$ 146;AT
6,18;CHR$ 147;AT 6,22;CHR$ 148
34 PRINT AT 7,6;"1";AT 7,10;"2
";AT 7,14;"3";AT 7,18;"4";AT 7,2
2;"5"
35 BEEP .2,14: BEEP .4,11
40 INPUT "Guess which symbol: E
nter its No. ";a
50 IF a<0 OR a>5 THEN GO TO 40
60 PRINT AT 10,10;CHR$ (143+a)
: PRINT AT 12,10;"YOU"
70 PRINT AT 10,25;CHR$ (143+rp
): PRINT AT 12,24;"COMPUTER"
80 IF a=rp THEN LET z=z+1: FOR
n=1 TO 25: BEEP .1,a+n: NEXT n:
INVERSE 1: PRINT AT 13,6;"CORR
ECT=";z: INVERSE 0
81 IF a<>rp THEN BEEP .3,(-5-a
)

```

```

86 PRINT AT 20,10;"GUESSES LEF
T=";25-t;" " : PAUSE 25: NEXT
t
90 LET p=z/25*100: PRINT AT 12
,5;"Your score is ";p;"% .Normal
is 20%"
100 IF p>20 THEN PRINT AT 17,5;
"Your ESP ability is ";(p-20);"
% above normal"
105 IF t<=0 THEN STOP
110 FOR n=144 TO 148
120 FOR f=0 TO 7
125 READ x
130 POKE USR CHR$ (n)+f,x
140 NEXT f
150 NEXT n
160 DATA 24,36,66,129,129,66,36
,24
170 DATA 82,137,82,137,82,137,8
2,137
180 DATA 24,24,24,255,255,24,24
,24
190 DATA 153,90,60,255,60,90,15
3,0
200 DATA 255,129,129,129,129,12
9,129,255
210 STOP

```




THE PURPOSE of **The Knight's Tour** is for the knight to start from any square on the chess board and, using his usual 'L'-shaped moves, to visit each square of the chess board in turn, without landing on any of them more than once.

Input the number of your knight's starting square—any number from 1 to 64—and press NEWLINE after every move to see the computer move your knight around the board. Graphics are entered using standard graphic notation.

The program was written for the 1K ZX-81 by Denis McCarthy of Todmorden, Lancashire.

THE KNIGHT'S TOUR

```

2 LET M=VAL "2"
3 LET A$="0111170212274257513
62106163146615540301307243956624
56050334337476454486353382308142
94459493419041025355258412609032
0051532222818"
4 INPUT L
5 FOR A=M TO LEN A$ STEP M
6 IF VAL A$(A-SGN PI TO A)<>L
THEN NEXT A
7 LET A$=A$(A-SGN PI TO )+A$(
TO A-M)
8 FOR A=M TO LEN A$ STEP M

```

```

9 FOR B=0 TO 3
10~PRINT "(sp'isp'isp'isp'isp'is
p'isp'isp)",,"(isp'isp'isp'isp'isp'
sp'isp'isp)"
11 NEXT B
12 LET C=VAL A$(A-SGN PI TO A)
-1
13 PRINT AT INT (C/VAL "8"),C-
VAL "8"*INT (C/VAL "8"),"N"
14 INPUT B#
15 CLS
16 NEXT A

```




BEETLE RUN

YOU ARE a beetle, scurrying around the screen of your Spectrum. Your aim is to move as many times as possible before you die. You must avoid the blocks which keep appearing around you. If you are surrounded by blocks, or walk into one, the Death March will play and your score will be displayed. Move using the normal cursor keys.

The program was written for the 16K Spectrum by G Lyons of Porton, Wiltshire.

Use graphic 'A' in lines 160 and 3000, and graphic 'B' in lines 105, 106, 108 and 100.

```

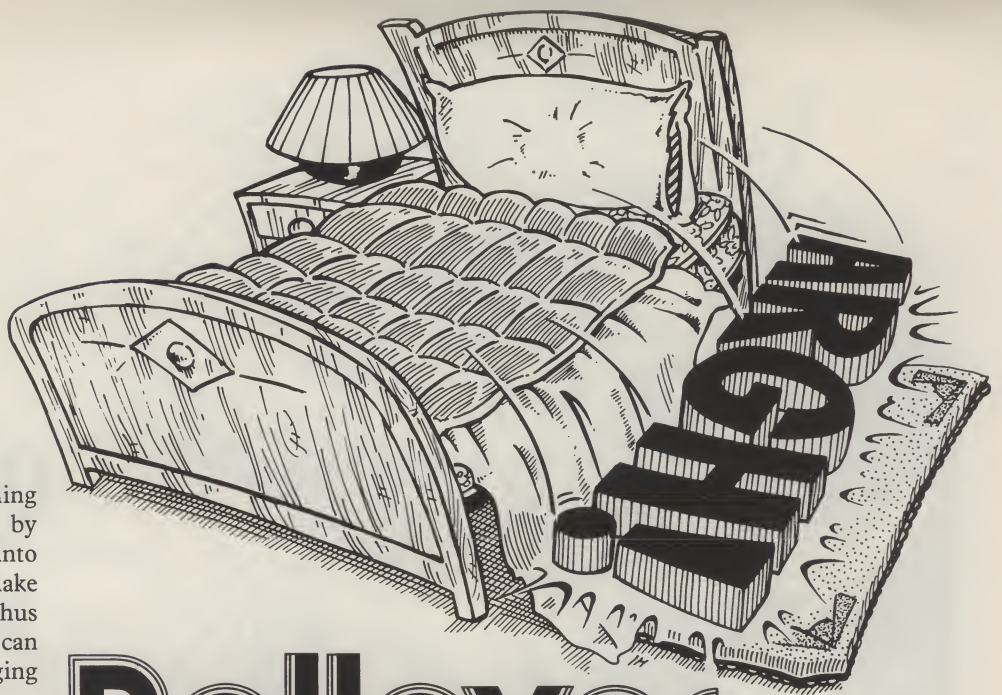
4 DATA 0,24,165,126,60,60,126
,153
5 FOR t=0 TO 7
6 READ X
7 POKE USR "A"+t,X
8 NEXT t
10 DATA 255,129,189,165,165,18
9,129,255
20 FOR t=0 TO 7
30 READ X
40 POKE USR "B"+t,X
50 NEXT t
53 BORDER 0
59 LET hs=0
60 CLS
70 LET x=10
75 LET y=15
80 LET s=0: PRINT AT 21,0;"Sco
re=";s
90 PRINT AT 21,12;"Hi-score=";
hs
100 PRINT INK 0; PAPER 2;AT 1,1
;"BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
"
125 PRINT INK 0; PAPER 2;AT 20,
1;"BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB
B"
106 FOR f=1 TO 20: PRINT INK 0;
PAPER 2;AT f,1;"B": NEXT f
108 FOR f=1 TO 20: PRINT INK 0;
PAPER 2;AT f,30;"B": NEXT f
160 PRINT INK 0;AT x,y;"A": FOR
f=1 TO 5: BEEP .005,f: NEXT f
165 LET s=s+1: PRINT AT 21,6;s
167 IF hs<s THEN LET hs=s: PRIN
T AT 21,21;hs
170 LET a=y+INT (RND*-3)+2
180 LET b=x+INT (RND*-3)+2
185 IF b=x AND a=y THEN GO TO 1
70
190 PRINT INK 0; PAPER 2;AT b,a
;"B": BEEP .2,-20: BEEP .3,-21
191 IF SCREEN$ (x-1,y)<>" " THE
N GO TO 193
192 GO TO 200
193 IF SCREEN$ (x+1,y)<>" " THE
N GO TO 196
195 GO TO 200

```

```

196 IF SCREEN$ (x,y+1)<>" " THE
N GO TO 198
197 GO TO 200
198 IF SCREEN$ (x,y-1)<>" " THE
N GO TO 3000
200 LET d=1
210 IF INKEY$="5" AND y>2 THEN
GO TO 1000
220 IF INKEY$="8" AND y<29 THEN
GO TO 1100
230 IF INKEY$="7" AND x>2 THEN
GO TO 1200
240 IF INKEY$="6" AND x<19 THEN
GO TO 1300
250 LET d=d+1: IF d=10 THEN GO
TO 170
260 GO TO 210
1000 PRINT AT x,y;" ": LET y=y-1
: IF SCREEN$ (x,y)<>" " THEN GO
TO 2000
1001 GO TO 160
1100 PRINT AT x,y;" ": LET y=y+1
: IF SCREEN$ (x,y)<>" " THEN GO
TO 2000
1101 GO TO 160
1200 PRINT AT x,y;" ": LET x=x-1
: IF SCREEN$ (x,y)<>" " THEN GO
TO 2000
1201 GO TO 160
1300 PRINT AT x,y;" ": LET x=x+1
: IF SCREEN$ (x,y)<>" " THEN GO
TO 2000
1301 GO TO 160
3000 PRINT ; FLASH 1;AT x,y;"A":
FOR f=1 TO 100: NEXT f
3001 BEEP 1,-12: BEEP .6,-12: BE
EP .3,-12: BEEP .9,-12: BEEP .6,
-9: BEEP .3,-10: BEEP .57,-10: B
EEP .3,-12: BEEP .6,-12
3002 BEEP .4,-13: BEEP 1,-12
3004 PRINT INK 0; PAPER 2;AT x,y
;"B"
3005 IF s>hs THEN LET hs=s
3010 PRINT FLASH 1;AT 0,10;"Anot
her go?"
3015 IF INKEY$<>" " THEN GO TO 60
3020 GO TO 3015

```

ROLLOVER is an eye-catching program which can be run by itself or incorporated into another program. It is designed to make a word, name or title roll over, thus drawing attention to it. Any word can be inserted in the program, by changing the values of x\$.

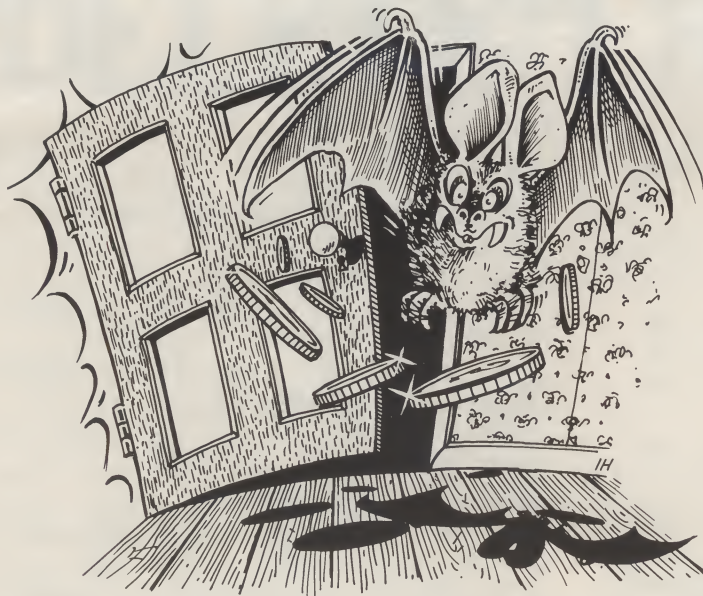
The program was written for the 16K or 48K Spectrum by Judy and Alastair Watt of Stowbridge, West Midlands.

Rollover

```

10 LET x$="Roll Over": GO SUB
9000
20 LET x$="Try Again": GO SUB
9000
30 STOP
9000 LET gr=PEEK 23675+256*PEEK
23675
9010 LET ch=PEEK 23606+256*PEEK
23607
9020 FOR z=0 TO (LEN x$-1): LET
a=CODE x$(z+1)
9030 FOR n=0 TO 7: LET v=PEEK (c
n+(a*8)+n)
9040 POKE (gr+(16*z)+n),v
9050 POKE (gr+(16*z)+8+n),v
9060 NEXT n: NEXT z
9070 FOR r=1 TO 10
9080 POKE 23675,88+8
9090 FOR n=7 TO 0 STEP -1: POKE
23675,(n+88)
9100 FOR z=1 TO LEN x$: LET x$(z
)=CHR$(142+2*z): NEXT z
9110 PRINT AT 10,10;x$: NEXT n:
NEXT r
9120 POKE 23675,65: RETURN

```



DOORS

A PROGRAM for the 1K ZX-81 by Darren Wombwell of Sutton-in-Ashfield, Nottinghamshire faces you with four doors. Choose the correct door and you will proceed to the next group of four doors, collecting one gold piece as you go. You could be

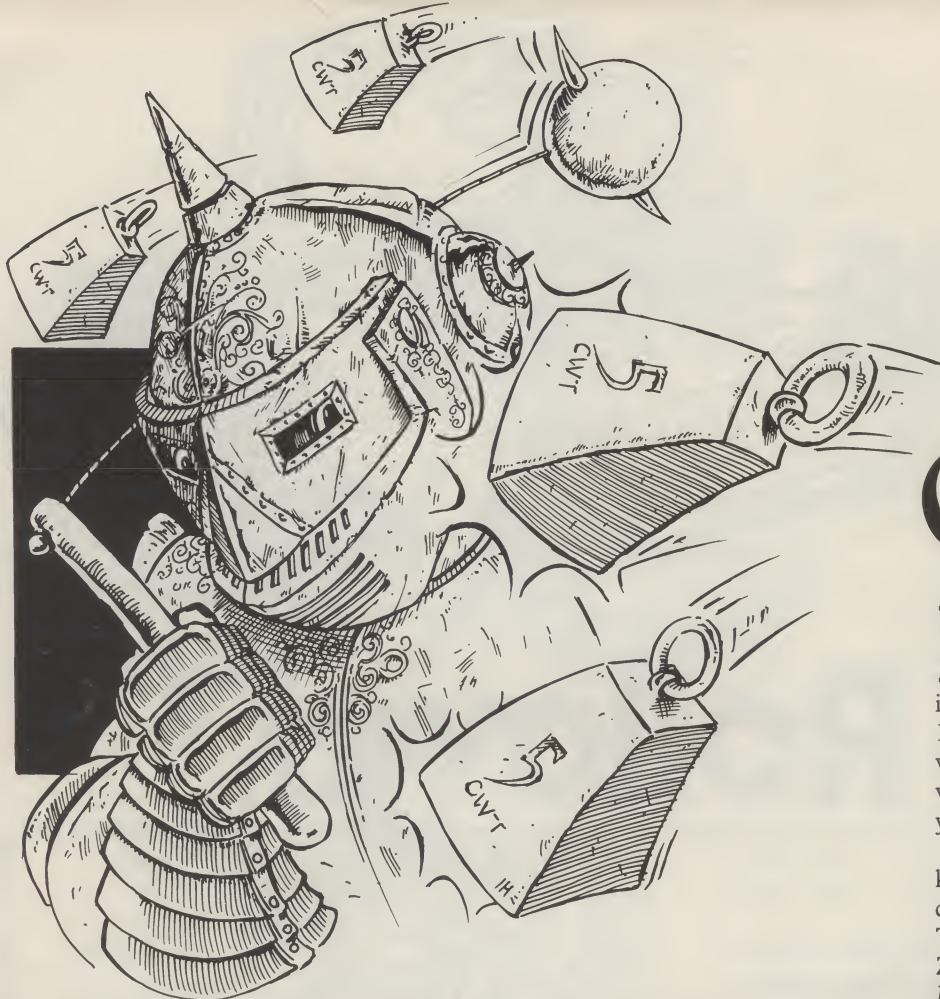
lucky and find a hoard of treasure, or you could be unlucky and meet a bat, which will steal 10 of your gold pieces.

The game ends when you open a door with a ghost behind it, for the ghost will scare you to death.

```

1 REM "DOOR"
2 LET D=1
3 LET S=0
4 LET F=11
5 LET H=16
6 CLS
7 PRINT "(sp:99:11:9w:sp:99:i
2:9w:sp:99:13:9w:sp:99:14:9w:sp)
";S
8 FOR N=1 TO 4
9 PRINT AT N,1;"(98:9h:95:sp:
98:9h:95:sp:98:9h:95:sp:98:9h:95
)"
10 NEXT N
12 INPUT X
13 LET T=INT (RND*4)
14 LET B=INT (RND*4)
15 LET G=INT (RND*4)
16 IF X=B THEN GOTO 25
17 IF X=T THEN GOTO 35
18 IF X=G THEN GOTO 45
19 LET S=S+1
20 GOTO 6
25 PRINT AT F,H;"(99:9t)"
26 LET S=S-10
27 PAUSE 50
28 GOTO 6
35 PRINT AT F,H;"t"
36 LET M=INT (RND*50)
37 LET S=S+M
38 PAUSE 50
39 GOTO 6
45 PRINT AT F,H;"i ";AT F+2,H;
"gold";S
46 IF S>100 THEN PRINT AT F+4
0;"champion"

```

Castles

BEWARE, there is a fearsome black knight about to storm your castle. The only way to stop him is to take one of your weights, numbers 1 to 9, and throw it at him. If your weight is the same as his body weight he will be catapulted into the moat and your score will increase.

You have three chances to sink your knight. If you fail, he will invade the castle and your score will be displayed. The program was written for the 16K ZX-81 by V Reidy of South Harrow, Middlesex.

```

10 REM "CASTLE"
20 PRINT AT 12,0;"(4*isp:9f:9a
:9f:25*isp)";AT 4,19;"(5*isp)";A
T 3,19;"(9w:9a:96:9w:9a)"
30 FOR A=5 TO 11
40 PRINT AT A,20;"(3*isp)"
50 NEXT A
60 PRINT AT 11,21;"(9a)";AT 9,
20;"(i+)";AT 7,22;"(i+)";AT 5,21
;"(i+)"
70 LET S=0
73 LET L=0
80 LET I=INT (RND*9)+1
82 LET K=1
83 LET L=L+1
85 PRINT AT 11,18;" "
90 FOR A=K TO 16
100 PRINT AT 11,A;"(sp:i*)"
110 NEXT A
115 IF L=4 THEN GOTO 300
120 PRINT AT 16,1;"A BLACK KNIG
HT IS APPROACHING          DROP YO
UR WEIGHT NOW "
130 INPUT W
140 PRINT AT 16,1;"
150 FOR A=4 TO 11
160 PRINT AT A,18;CHR# (156+W)
165 PRINT AT A-1,18;" "
168 NEXT A
170 IF W>I THEN GOTO 220
180 IF W<I THEN GOTO 250
185 FOR A=6 TO 12

```

```

190 PRINT AT 8+8*SIN (A/6*PI)+3
,6-6*COS (A/6*PI)+5;"(i*)"
195 PRINT AT 8+8*SIN (A/6*PI)+3
,6-6*COS (A/6*PI)+5;" "
200 NEXT A
210 PRINT AT 12,5;"(i*)";AT 16,
1;"IN THE MOAT "
211 PAUSE 60
212 LET S=S+1
213 PRINT AT 12,5;"(9a)"
215 GOTO 73
220 FOR A=6 TO 12
230 PRINT AT 8+8*SIN (A/6*PI)+3
,8-8*COS (A/6*PI)+1;"(i*)"
235 PRINT AT 8+8*SIN (A/6*PI)+3
,8-8*COS (A/6*PI)+1;" "
240 NEXT A
245 GOTO 82
250 FOR A=6 TO 12
260 PRINT AT 8+8*SIN (A/6*PI)+3
,4-4*COS (A/6*PI)+9;"(i*)"
270 PRINT AT 8+8*SIN (A/6*PI)+3
,4-4*COS (A/6*PI)+9;" "
280 NEXT A
285 LET K=9
290 GOTO 83
300 PRINT AT 16,0;"THE BLACK KN
IGHT HAS INVADED          NUMBER OF KN
IGHTS REPELLED ";S
310 FOR A=16 TO 18
320 PRINT AT 11,A;"(sp:i*)"
330 NEXT A

```




DELETE THE DOTS

DELETE THE DOTS is a program for the 1K ZX-81 designed by Graham Deering of Surrey to test your speed with the cursor keys. A number of dots are displayed

on the screen and your flashing spot is required to wipe out all of them, using the usual cursor keys.

The program allows you to choose how many dots are displayed and, by

pressing 0 when you have deleted your dots, you can have the time which you have taken displayed on the screen.

```

1 LET A=10
2 LET B=10
3 LET T=0
4 PRINT "9,18,27 OR 36 DOTS?"
5 INPUT A#
6 IF A#="9" THEN GOTO 14
7 IF A#="18" THEN GOTO 16
8 IF A#="27" THEN GOTO 16
9 IF A#="36" THEN GOTO 20
14 FOR N=1 TO 9
15 GOTO 40
16 FOR N=1 TO 18
17 GOTO 40
18 FOR N=1 TO 27
19 GOTO 40
20 FOR N=1 TO 36
40 LET C=INT (RND*40)+1
50 LET D=INT (RND*40)+1
60 PLOT C,D
70 NEXT N

```

```

80 UNPLOT A,B
85 LET T=T+1
90 IF INKEY#="5" THEN LET A=A-1
100 IF INKEY#="8" THEN LET A=A-1
110 IF INKEY#="6" THEN LET B=B-1
120 IF INKEY#="7" THEN LET B=B-1
130 PLOT A,B
140 IF INKEY#="0" THEN GOTO 160
150 GOTO 80
160 PRINT T/5
161 IF T<40 THEN PRINT "WELL DONE"
165 PAUSE 500
170 CLS
180 RUN

```


SPECTRAL PIANO

WE HAD a good deal of difficulty selecting a Spectrum piano-playing routine for the magazine. Fourteen-year-old Tim Whittaker of Cardiff faced stiff competition, most notably from Paul Matthews, before winning the nomination with his clear and easily-mastered **Spectral Piano**.

Whittaker has been programming for two years, during which time he upgraded his machine from a ZX-81 to a

Spectrum. He is a completely self-taught programmer as there has, as yet, been no opportunity for him to study computing at school. He wrote the program in one day, basing it on his knowledge of the piano. Once he has mastered machine code he hopes to be able to develop it further and give his Spectrum the full capabilities of an electronic organ.

When the program is RUN the screen shows a section of keyboard with

keys which appear to move. Pressing the appropriate key causes the notes played to be raised or lowered by an octave, giving a range stretching from bottom C to top B. It is likewise very easy to vary the length of the note—any key from 1 to 9 will change it instantly.

All instructions are included in the program. Capital letters in quotation marks in lines 400 to 500 should be entered in graphics mode. (16K Spectrum).

```

10 GO SUB 1000
14 FOR c=144 TO 151
15 FOR n=0 TO 7
16 READ a: POKE USA CHR$(c+n,a)
17 NEXT n: NEXT c
18 DATA 15,15,15,15,15,15,7,0
19 DATA 240,240,240,240,240,240,24
0,224,128
20 DATA 15,15,15,15,7,0,0,0
21 DATA 240,240,240,240,224,12
8,128,128
22 DATA 128,128,128,128,128,25
5,128,128
23 DATA 0,0,0,0,0,255,0,0
24 DATA 128,128,255,128,128,12
8,128,128
25 DATA 0,0,255,0,0,0,0,0
30 PAPER 2: BORDER 0: CLS
40 REM variables
41 LET a$="middle"
42 LET len=.3
43 LET o=0
100 REM keyboard
105 PAPER 7
110 FOR n=8 TO 21: FOR m=7 TO 1
4
120 PRINT AT m,n;" "
130 NEXT m: NEXT n
140 INK 0: PLOT 64,61: DRAW 111
150 FOR n=64 TO 162 STEP 16: PL
OT n,66: DRAW 0,63: NEXT n
160 FOR n=9 TO 20 STEP 2: FOR m
=7 TO 10
170 IF n=13 THEN NEXT n
180 PRINT AT m,n;"■": REM 5+
shifted 5
190 NEXT m: PRINT AT m,n;"CD":
REM 5 CD
200 NEXT n
300 REM notes
310 IF INKEY$="i" THEN LET o=-1
2: LET a$="bottom"
315 IF INKEY$="o" THEN LET o=0:
LET a$="middle"
320 IF INKEY$="p" THEN LET o=12
: LET a$="top"
321 IF INKEY$="1" THEN LET len=
.1
322 IF INKEY$="2" THEN LET len=
.2

```

```

323 IF INKEY$="3" THEN LET len=
.3
324 IF INKEY$="4" THEN LET len=
.4
325 IF INKEY$="5" THEN LET len=
.5
326 IF INKEY$="6" THEN LET len=
.6
327 IF INKEY$="7" THEN LET len=
.7
328 IF INKEY$="8" THEN LET len=
.8
329 IF INKEY$="9" THEN LET len=
.9
340 INK 7: PAPER 2: PRINT AT 0,
20;"Length ";len;" "
350 PRINT AT 16,9;"↑";AT 17,7;a
$;"C"
400 INK 0: PAPER 7: IF INKEY$="
a" THEN PRINT AT 14,8;"EF": BEEP
len,0+o: PRINT AT 14,8;"GH"
410 IF INKEY$="w" THEN PRINT AT
11,9;"AB": BEEP len,1+o: PRINT
AT 11,9;"CD"
420 IF INKEY$="s" THEN PRINT AT
14,10;"EF": BEEP len,2+o: PRINT
AT 14,10;"GH"
430 IF INKEY$="e" THEN PRINT AT
11,11;"AB": BEEP len,3+o: PRINT
AT 11,11;"CD"
440 IF INKEY$="d" THEN PRINT AT
14,12;"EF": BEEP len,4+o: PRINT
AT 14,12;"GH"
450 IF INKEY$="f" THEN PRINT AT
14,14;"EF": BEEP len,5+o: PRINT
AT 14,14;"GH"
460 IF INKEY$="t" THEN PRINT AT
11,15;"AB": BEEP len,6+o: PRINT
AT 11,15;"CD"
470 IF INKEY$="g" THEN PRINT AT
14,16;"EF": BEEP len,7+o: PRINT
AT 14,16;"GH"
480 IF INKEY$="y" THEN PRINT AT
11,17;"AB": BEEP len,8+o: PRINT
AT 11,17;"CD"
485 IF INKEY$="h" THEN PRINT AT
14,18;"EF": BEEP len,9+o: PRINT
AT 14,18;"GH"
490 IF INKEY$="u" THEN PRINT AT
11,19;"AB": BEEP len,10+o: PRIN
T AT 11,19;"CD"

```




```

500 IF INKEY$="j" THEN PRINT AT
14,20;"EF": BEEP len,11+0: PRIN
T AT 14,20;"GH"
600 GO TO 300
1000 PAPER 2: CLS: PRINT INK 7;
AT 0,7;"Spectral piano": OVER,1;
INK 7;AT 0,7;"
1005 LET n$="ASDFGHJ"
1010 LET l=1: FOR n=7 TO 20 STEP
2: PRINT PAPER 7: INK 0;AT 10,n
;n$(l): LET l=l+1: NEXT n
1020 LET n$="WETYU"
1030 LET l=1: FOR n=8 TO 18 STEP
2: IF n=12 THEN NEXT n
1040 PRINT PAPER 0: INK 7;AT 8,n
;n$(l): LET l=l+1: NEXT n
1050 PRINT AT 6,0;"USE THESE KEY
S":AT 11,7;"↑":AT 12,3;"MIDDLE C"
1060 PRINT AT 4,20;"octave keys"
: PRINT AT 6,22;"[ ] [ ] [ ]"
1070 PRINT AT 2,2;"Length of not
e in frctions":AT 3,4;"of a seco
nd":AT 4,1;"[ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]"
1080 PRINT INK 7;AT 14,0;"Spectr
al Piano is a computer version
of a piano.Once you knowhow it
works you will soon be trying
to play your own tunes."
1090 INPUT "When ready press ent
er":z$
1100 PRINT OVER 1: FLASH 1: PAPE
R 7;AT 12,3;"": FLASH 0:
OVER 0: PAPER 2: INK 7;AT 14,0;
"The keyboard is set out like
that of a real piano.By pressin
g the keys A TO J (on the second
row up)you will get a note from

```

middle C TO B.To obtain the sharps and flats press any of the keys displayed in white on black.

1110 INPUT "press enter when rea
dy":z\$
1120 PRINT INK 7;AT 14,0;"S.p al
so has a function to alterthe oc
tave you are playing in, and a
function to change the length
of a note.

1-If at any time durin
g playing you wish to change
octaves just press key [] to get
the octave starting at bottom
C, key [] to get the middle C oct
ave and [] to get the top C octav
e

1130 INPUT "press enter when rea
dy":z\$

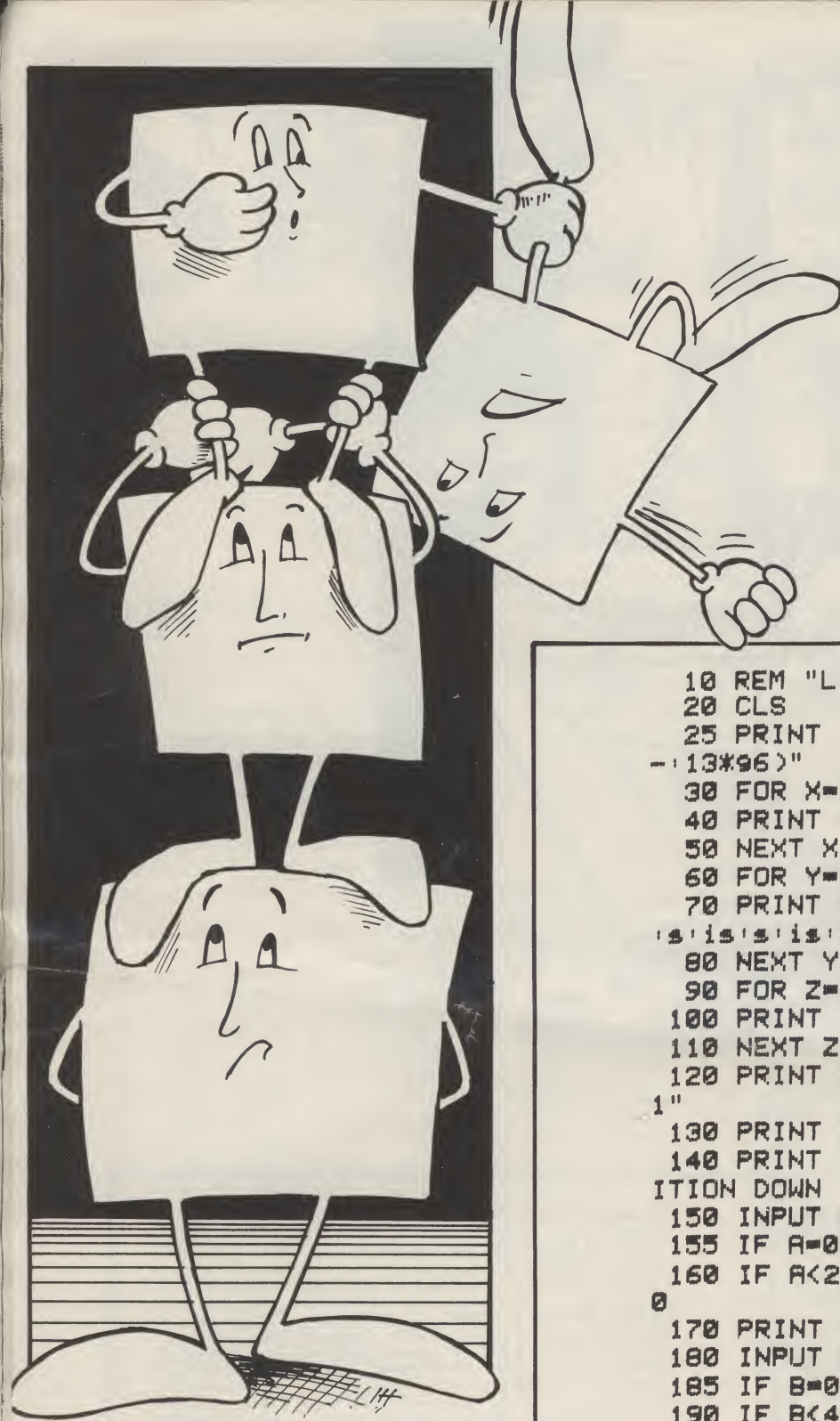
1140 PRINT INK 7;AT 9,0;"2.-if a
t any time during playing you wi
sh to change the duration of the
notes you are pressing press a
ny key from 1 TO 9.The higher
the number the longer the not
e

1150 FOR n=15 TO 21: PRINT AT n,
0;"": NEXT n: REM 32

1190 INPUT "Have you understood?
(y/n)":z\$: IF z\$(<>"y") THEN GO TO
1000

1200 RETURN
9998 PAUSE 0
9999 PAPER 7: INK 0: BORDER 7: F
LASH 0: CLS

LINE FOUR



VALERIE JAMIESON of Glasgow sent this computerised version of a traditional game, which can be played on the 16K ZX-81. You and your rival attempt to complete a line of four squares, while each tries to prevent the other completing a line.

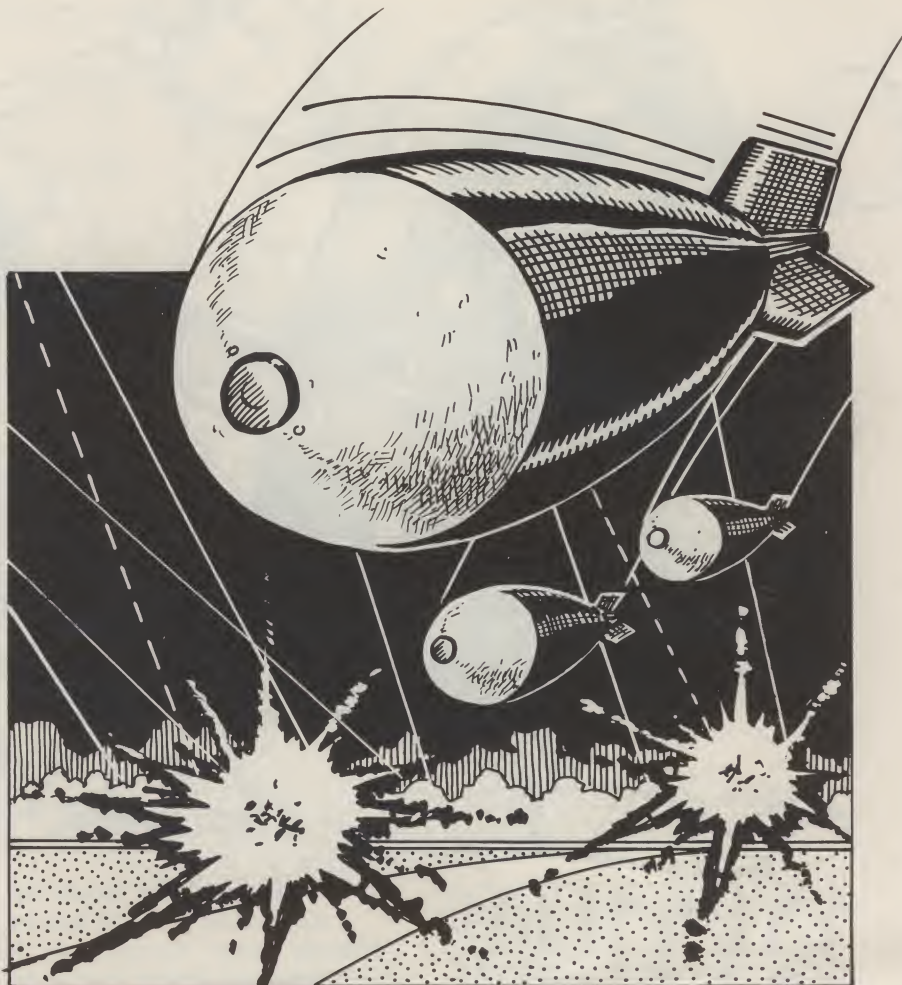
Graphics instructions are given in an abbreviated form in lower-case letters in brackets. Lower-case 'g' stands for 'graphic' and lower-case 'i' stands for 'inverse'. Thus 'is' stands for 'inverse space', 'il' for 'inverse 1', and 'g6' for 'graphic 6'.

```

10 REM "LINE"
20 CLS
25 PRINT "(12*96:il:ii:in:ie:i
--13*96)"
30 FOR X=2 TO 13 STEP 2
40 PRINT AT X,1,X
50 NEXT X
60 FOR Y=2 TO 13
70 PRINT AT Y,3,"(is:is:is:is:is
is:is:is:is:is:is:is)"
80 NEXT Y
90 FOR Z=3 TO 14 STEP 2
100 PRINT AT Z,3,"(14*is)"
110 NEXT Z
120 PRINT AT 14,4,"4 6 8 1 1 1
1"
130 PRINT AT 15,10,"0 2 4 6"
140 PRINT AT 20,0,"PLAYER 1 POS
ITION DOWN "
150 INPUT A
155 IF A=00 THEN RUN
160 IF A<2 OR A>12 THEN GOTO 14
0
170 PRINT AT 20,18,"ACROSS"
180 INPUT B
185 IF B=00 THEN RUN
190 IF B<4 OR B>16 THEN GOTO 18
0
200 PRINT AT A,B,"(11)"
210 PRINT AT 20,7,"2" AT 20,18,
"DOWN "
220 INPUT C
225 IF C=00 THEN RUN
230 IF C<2 OR C>12 THEN GOTO 20
0
240 PRINT AT 20,18,"ACROSS"
250 INPUT D
265 IF D=00 THEN RUN
270 IF D<4 OR D>16 THEN GOTO 23
0
280 PRINT AT C,D,"(12)"
290 GOTO 140

```


FLYING BLIMP LANDSCAPE



YOU FLY through the air, using keys 6 and 7 to move up and down. You must shoot as many flying bombs as possible, using any other key.

Avoid crashing into the landscape or the game will end.

The game was written for the 16K Spectrum by John Hopper of Solihull, West Midlands.

```

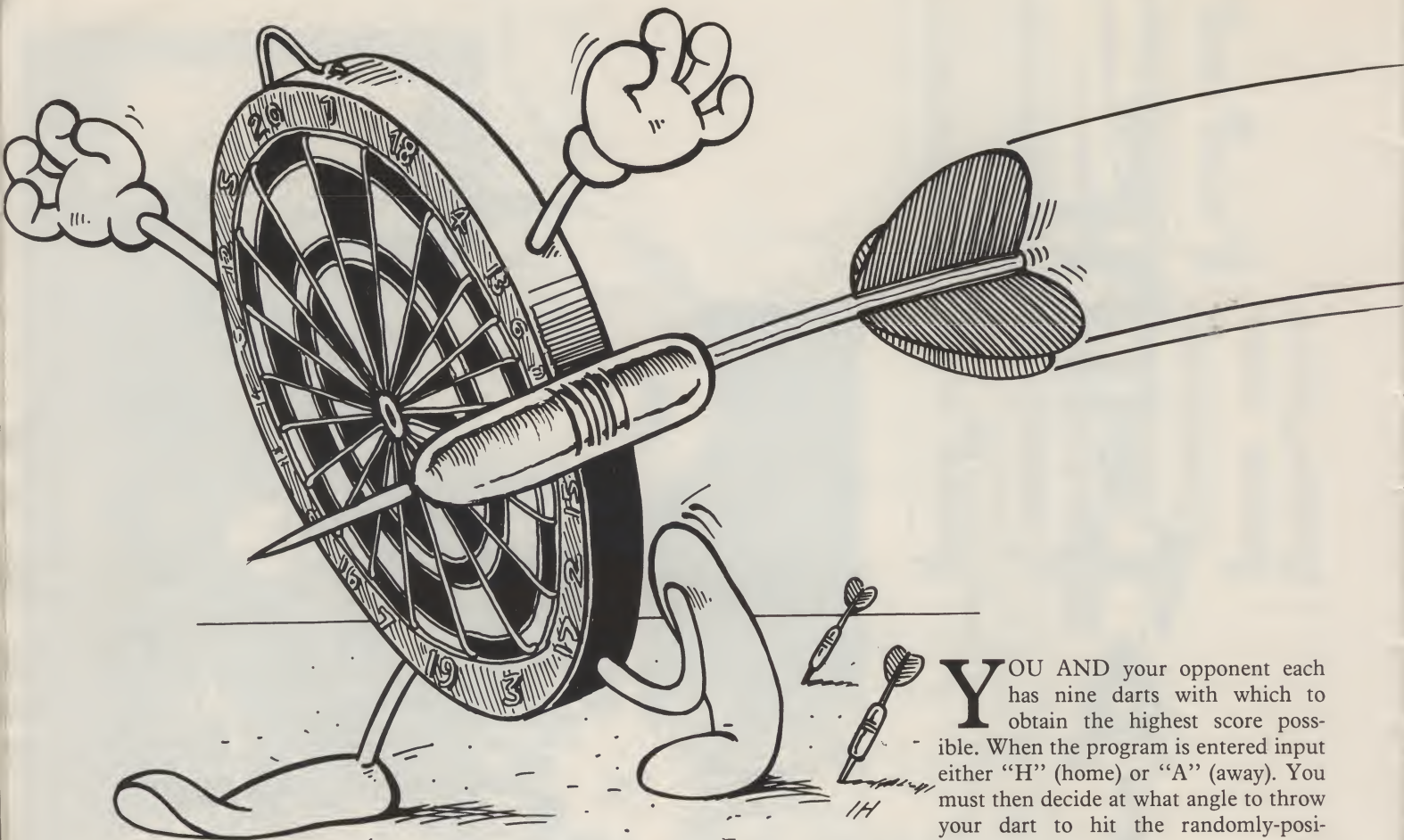
1 REM .....
****
5 LET a=S+PEEK 23635+256*PEEK
23636
10 FOR n=a TO a+24: READ a$
15 LET x=CODE a$-48-(39*(a$>"f
")): LET y=CODE a$(2)-48-(39*(a$
(2)>"f"))
20 POKE n,x*16+y: NEXT n
30 DATA "06","c0","11","00","4
0","d5","e1","23","c5","01","1f"
"00","1a","ed","b0","2b","77"
"00","23","23","13","c1","10","f0
","c9"
100 GO SUB 1000
110 LET sc=0: LET a=10: LET b1=
0: LET c1=175
120 POKE 23760+16,54
130 PLOT 240,0
190 BORDER 1: PAPER 1: INK 6: C
LS
200 LET b=INT (RND*100)-50
210 IF b1+b>140 OR b1+b<7 THEN
LET b=0
220 PLOT 240,b1: DRAW 8,b
230 LET b1=b1+b
240 LET l=USR 23760
250 PRINT AT a,12;" "
260 IF SCREEN$(a,14)<>" " THEN
GO SUB 2000
270 IF INKEY$="6" AND a<20 THEN
LET a=a+1
280 IF INKEY$="7" AND a>0 THEN
LET a=a-1
290 PRINT INK 6; BRIGHT 1; PAPE
R 1; AT a,12;" "
300 IF INKEY$<>" " AND INKEY$<>"
6" AND INKEY$<>"7" THEN GO TO 70
00
331 PAUSE 5
340 IF RND*50>=15 THEN GO SUB 3

```

```

500
350 BEEP .001,50
360 GO TO 200
1000 RESTORE 1005
1005 DATA 0,0,240,100,127,252,12
0,0
1010 FOR f=0 TO 7: READ a: POKE
USR "a"+f,a: NEXT f
1020 DATA 0,0,0,0,170,0,0,0
1030 FOR f=0 TO 7: READ a: POKE
USR "d"+f,a: NEXT f
1100 RETURN
2000 PRINT AT 3,0; BRIGHT 1; PAP
ER 2; INK 7;"SCORE="; FLASH 1;sc
: PRINT AT a,14; INK 7; FLASH 1;
" "; BORDER INT (RND*8): PRINT I
NK 2; BRIGHT 1; FLASH 1; PAPER 5
; AT 12,10;"-HIT-HIT-HIT-": BEEP
.01,RND*50: GO TO 2000
3500 LET x2=INT (21-(b1/8))-1
3510 LET x=INT (RND*x2)
3520 PRINT AT INT x,29;"f"
3530 IF RND*60<2 THEN PRINT AT x
,29;"*"
3540 RETURN
7000 FOR f=14 TO 20
7010 PRINT INK 5; AT a,f;"-"
7020 IF SCREEN$(a,f+1)<>" " THE
N GO TO 7040
7030 NEXT f
7040 IF SCREEN$(a,f+1)="f" THEN
BEEP .01,10: LET sc=sc+1: FOR h
=14 TO f+1: PRINT AT a,h;" ": NE
XT h: GO TO 322
7045 IF SCREEN$(a,f+1)="*" THEN
BEEP .01,30: LET sc=sc+10: FOR
h=14 TO f+1: PRINT AT a,h;" ": N
EXT h: GO TO 322
7050 FOR h=14 TO f: PRINT AT a,h
;" ": NEXT h: GO TO 322

```

DAIRTS

YOU AND your opponent each has nine darts with which to obtain the highest score possible. When the program is entered input either "H" (home) or "A" (away). You must then decide at what angle to throw your dart to hit the randomly-positioned board opposite.

To input your angle, first press "I" and input a number less than 35 when the prompt appears. Once you have thrown three darts your opponent will be given the opportunity to input "H" or "A" and to have three throws.

The program was written for the 16K ZX-81 by Kevin Snowdon of Gateshead, Tyne-and-Wear.

```

1 REM "150"
2 FAST
3 LET T=0
4 LET T1=0
5 LET SH=0
6 LET A=0
7 LET S=0
8 LET F=3
9 LET I=0
10 LET H=3
11 PRINT AT 0,13;"H LEG ";AT 0
,21;"SCORE ";AT 1,13;"A LEG ";AT
1,21;"SCORE "
12 FOR N=0 TO 11
13 PLOT 60,N
14 NEXT N
16 FOR N=5 TO 14
18 PLOT 59,N
19 PLOT 58,N
20 NEXT N
21 FOR N=5 TO 11
22 PLOT 57,N
23 NEXT N
30 PLOT 56,11
35 PLOT 55,9
40 PLOT 55,10
45 PLOT 54,8
50 PLOT 53,8
55 PLOT 56,4
60 PLOT 56,5
65 PLOT 55,2
70 PLOT 55,3
75 PLOT 54,0
80 PLOT 54,1
82 PLOT 53,0

```

```

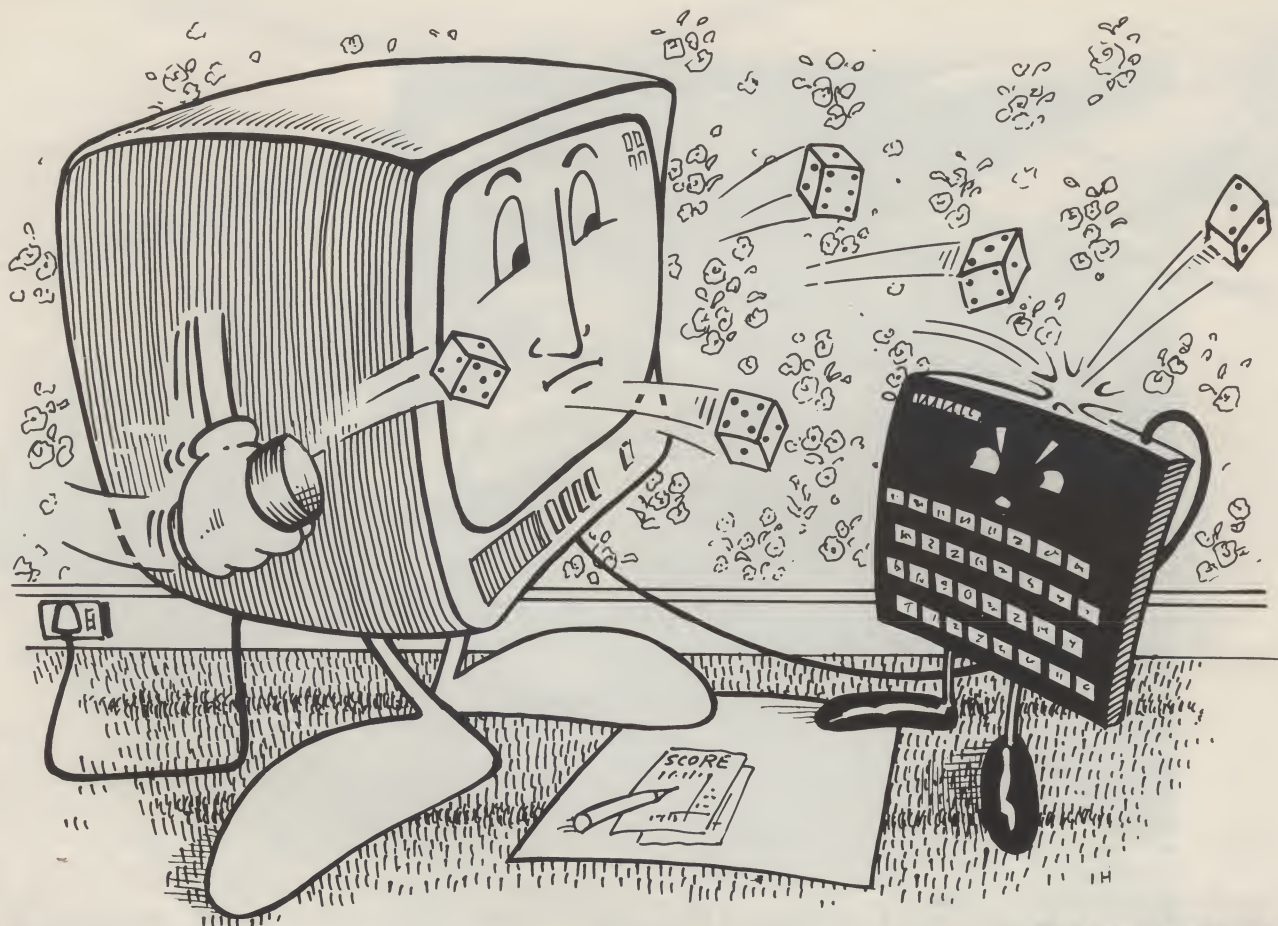
83 INPUT A$
84 IF A$="H" THEN LET T=T+1
85 IF A$="A" THEN LET T1=T1+1
89 IF T>3 AND T1=3 THEN STOP
90 IF T>3 AND T1>3 THEN STOP
91 GOSUB 500
92 SLOW
93 PRINT AT 15,25;" ";AT 15,2
5;"<="
95 LET R=0
100 FOR N=11 TO 8 STEP -1
110 UNPLOT 51+(R/2),N
120 PLOT 53,N
125 LET R=R+1
130 NEXT N
132 PRINT AT 15,26;" ";AT 15,2
5;"<="
135 LET R=0
140 FOR N=11 TO 8 STEP -1
150 PLOT 51+(R/2),N
152 UNPLOT 53,N
155 LET R=R+1
160 NEXT N
165 IF INKEY$="I" THEN GOTO 180
170 GOTO 93
180 INPUT R
182 IF R>35 THEN GOTO 180
185 LET C=0
186 LET D=0
190 FOR N=25 TO 3 STEP -1
200 LET D=15-(INT ((TAN (R/180*
PI))*C))
202 IF D<=0 THEN GOTO 90
205 PRINT AT D,N;"<="
210 FOR W=1 TO 2

```

```

215 NEXT W
220 PRINT AT D,N;" "
225 LET C=C+1
230 NEXT N
240 IF D>=A AND D<=A+4 THEN GOT
0 300
245 IF F<0 THEN GOTO 8
246 IF H<0 THEN GOTO 8
250 GOTO 90
300 IF D=A THEN LET I=I+50
305 IF D=A+1 THEN LET I=I+40
310 IF D=A+2 THEN LET I=I+30
315 IF D=A+3 THEN LET I=I+20
320 IF D=A+4 THEN LET I=I+10
321 IF A$="H" THEN LET S=S+I
322 IF A$="A" THEN LET SH=SH+I
330 PRINT AT 0,19;T;AT 0,27;S;A
T 1,19;T1;AT 1,27;SH
340 GOTO 245
500 FAST
502 LET I=0
505 FOR N=0 TO 4
510 PRINT AT A+N,0;" "
515 NEXT N
518 LET A=INT (15*RND)
520 PRINT AT A,0;"50(9h)";AT A+
1,0;"40(9a)";AT A+2,0;"30(9h)";A
T A+3,0;"20(9a)";AT A+4,0;"10(9h
)"
530 IF A$="H" THEN LET F=F-1
531 IF A$="A" THEN LET H=H-1
535 IF F<0 THEN GOTO 8
536 IF H<0 THEN GOTO 8
540 RETURN

```

YAHTZEE is a dice game for the expanded ZX-81, written by Richard Smith of Luton, Bedfordshire. Your aim is to collect as many dice showing the same number as possible with three throws. After each throw

you can choose which dice to keep as they are and which to throw again.

Skill is involved when deciding whether to keep several low-scoring, or one or two high-scoring dice. After every six rounds your score, and the high score, are shown.

YAHTZEE

```

2 REM R.SMITH 1983
5 SLOW
7 REM instructions
10 PRINT TAB 7;"COMPUTER YAHTZ
EE", "(7*SP:16*97)"
20 PRINT
25 PRINT "COLLECT A SET OF DIC
E TOGETHER EITHER ALL ONES,TWOS
OR THREES ETC."
30 PRINT "YOU DO THIS BY","INP
UTING A NO. (THE AMOUNT OF DIC
E YOU WISH TO KEEP)"
35 PRINT "E.G. 3 IF YOUR SET I
S"
40 PRINT "      5 4 1 5 5"
45 PRINT "THEN INPUT THE POSIT
IONS OF THE FIVES( IF 5 IS YOUR C
HOICE)"
47 PRINT "E.G 1 (N/L) 4 (N/L)
5 (N/L)"
52 PRINT "THIS WILL RETURN THE
SET OF DICE"
54 PRINT ",,"      5 5 5 ? ?
"
56 PRINT ",,"WHERE THE TWO ""?"
"S ARE NEWLY RANDOMLY GENERAT
ED NO""S.PERHAPS"
58 PRINT "THE NEW SET IS:",,"
5 5 5 1 5"
60 PRINT "Press n\l for next p
aragraph"
61 IF INKEY$="" THEN GOTO 61
62 CLS
64 PRINT "THE NEW SET IS:",,"
5 5 5 1 5"
66 PRINT "IN WHICH CASE YOUR N
EXT INPUT WOULD BE:4 FOLLOWED
BY 1,2,3,5"
68 PRINT
70 PRINT "YOU HAVE 3 ATTEMPTS

```

```

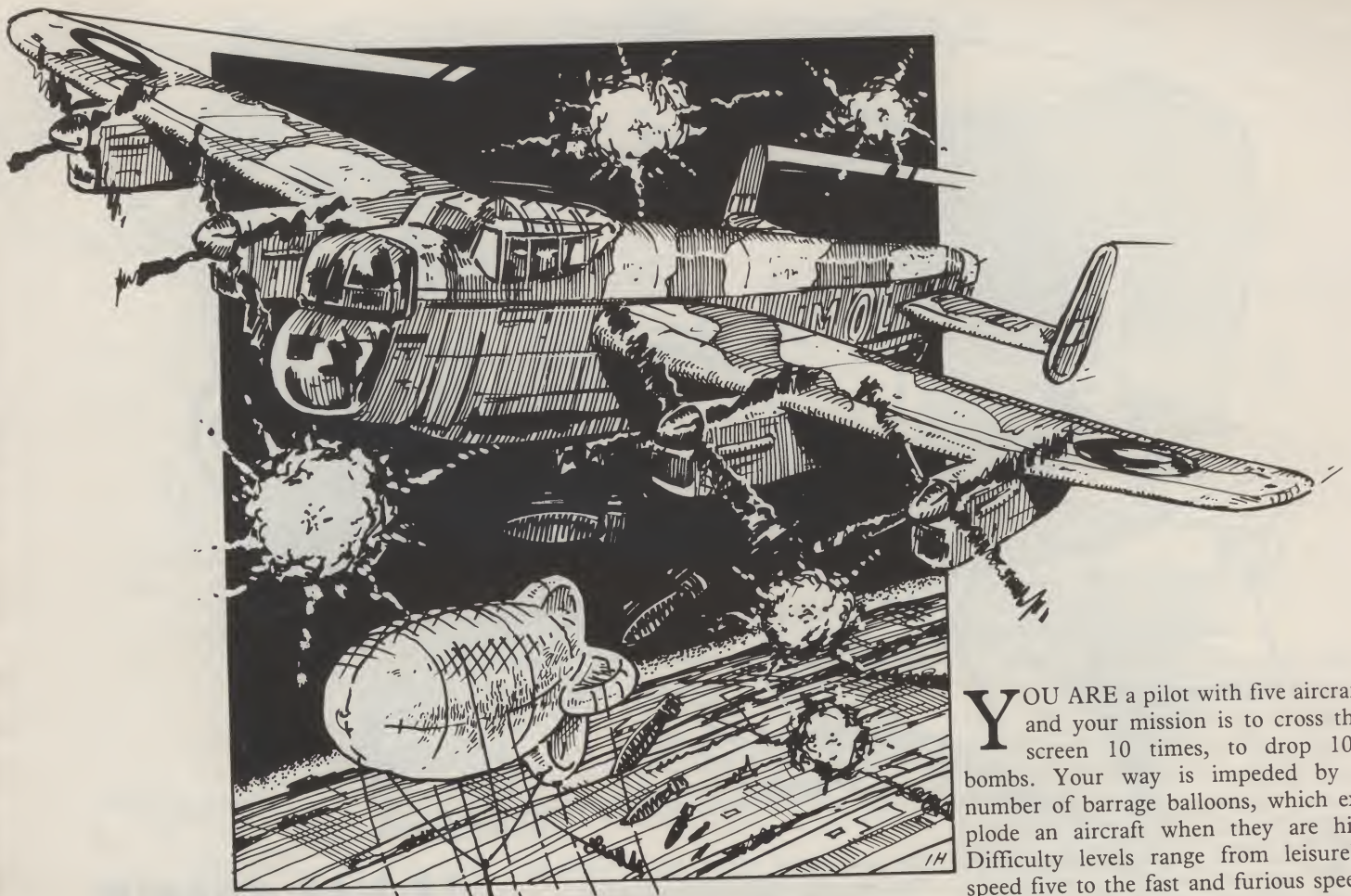
TO COLLECT THE DICE TOGETHER.A
FTER THIS:"
72 PRINT " ""CHOICE""WILL A
PPEAR"
74 PRINT "AS YOU ARE COLLECTIN
G FIVES YOU INPUT 5.THIS THEN CO
LLECTS AND ADDS ALL THE FIVES"
80 PRINT ",,"A SCORE IS GIVEN"
82 PRINT ",,"THERE ARE 6 ROUNDS
.THE SCORE IS INCREASED ACCORDIN
GLY."
84 PRINT ",,"THERE IS A HI-SCOR
E AND NAME FACILITY(9 LETTERS
MAX.)"
86 PRINT AT 21,0;"PRESS ANY KE
Y TO START THE GAME"
90 IF INKEY$="" THEN GOTO 90
95 REM Game
100 CLS
150 FAST
160 LET A$="???????"
170 LET Q=0
180 LET I=0
190 DIM D(5)
195 FOR V=1 TO 6
197 PRINT AT 6,0;"ROUND:";V
200 LET B=1
202 PRINT AT 0,7;"COMPUTER YAHT
ZEE"
203 PRINT AT 1,0;"(32*9H)"
205 PRINT AT 2,0;"(9H)SCORE=";I
,TAB 31;"(2*9H)HI SCORE=";Q,"BY
",A$,TAB 31;"(9H)"
207 PRINT AT 4,0;"(32*9H)"
210 FOR A=1 TO 3
220 FOR C=B TO 5
230 LET D(C)=INT (6*RND)+1
240 NEXT C
241 FOR J=1 TO 5
242 PRINT AT 8,J*4;D(J)

```

```

243 NEXT J
250 PRINT AT 10,6;"HOW MANY ? "
260 INPUT E
270 FOR F=1 TO E
275 PRINT AT 10,6;"POSITION"+("<
S" AND E>1);" ?"
280 INPUT G
290 LET D(F)=D(G)
300 NEXT F
310 LET B=E+1
320 NEXT A
325 PRINT "CHOICE ?(1-6)"
330 INPUT E
340 FOR A=1 TO 5
350 IF D(A)=E THEN LET I=I+D(A)
360 NEXT A
365 CLS
370 NEXT V
380 IF I>Q THEN GOTO 400
390 GOTO 190
400 SLOW
410 FOR G=0 TO 21
415 PRINT AT G,0;"(32*iSP)"
420 NEXT G
430 FOR G=0 TO 21
440 PRINT AT G,0;"
"
450 NEXT G
460 PRINT AT 5,0;"YOU HAVE ATTA
INED THE HIGH SCORE"
470 PRINT
480 PRINT "PLEASE ENTER YOUR NA
ME (9 LETTERS LIMIT)"
490 INPUT A$
500 LET Q=I
510 CLS
515 FAST
520 GOTO 180
600 SAVE "YAHTZE$"
610 RUN

```

BEAT THE BARRAGE

YOU ARE a pilot with five aircraft and your mission is to cross the screen 10 times, to drop 100 bombs. Your way is impeded by a number of barrage balloons, which explode an aircraft when they are hit. Difficulty levels range from leisurely speed five to the fast and furious speed one.

This program was written for the 16K Spectrum by David Rands of Harlington, Bedfordshire.

```

5 REM ***BEAT THE BARRAGE***
10 GO SUB 700
100 REM INSTRUCTIONS/DIFFICULTY
105 BORDER 6
110 PRINT AT 0,2;"BEAT THE BARRAGE"
120 PRINT AT 2,2;"You have to drop 100 bombs";AT 3,2;"to complete the mission";AT 4,2;"You have 5 planes"
125 PRINT AT 6,2;"Use z key to move downwards";AT 8,2;"Use m key to move upwards"
130 PRINT AT 10,2;"ENTER LEVELS OF DIFFICULTY"
140 PRINT AT 12,2;"First enter speed of planes";AT 13,2;"(1-5, 5 is slowest)"
150 INPUT sp: IF sp<1 OR sp>5 THEN GO TO 150
160 PRINT AT 15,2;"Now enter amount of";AT 16,2;"Barrage Balloons";AT 17,2;"(20-60, 20 is easiest)"
170 INPUT ba: IF ba<20 OR ba>60 THEN GO TO 170
180 LET cr=0: LET sc=0
190 CLS
200 REM INITIATE BALLOONS
210 FOR n=1 TO ba
220 LET v=INT (RND*18)+3
230 LET h=INT (RND*32): IF h<3 THEN LET h=3
240 PRINT AT v,h: INK 4;CHR$ 14
250 NEXT n
260 PRINT AT 21,0;"BOMBS AWAY=";sc: BEEP .2,20
270 IF sc=100 THEN GO TO 500
280 PRINT AT 21,16;"PLANES LOST=";cr
290 IF cr=5 THEN GO TO 500
295 PAUSE 100
300 REM PLANES
310 LET v=INT (RND*18)+3
320 FOR h=0 TO 31
330 LET c$=INKEY$

```

```

340 IF c$="" THEN PRINT AT v,h-1;" "
350 IF c$="z" THEN PRINT AT v,h-1;" "
360 IF c$="m" THEN PRINT AT v,h-1;" "
370 IF h=31 THEN GO TO 600
380 IF ATTR (v,h)=60 THEN PRINT AT v,h: INK 2; FLASH 1; BRIGHT 1;CHR$ 147: FOR n=1 TO 25: BEEP .06,-15: BEEP .1,15: NEXT n: PRINT AT v,h;" "
390 PRINT AT v,h;CHR$ 144
400 PAUSE sp
410 NEXT h
500 REM END GAME
510 PRINT AT 10,10: INK 3; FLASH 1;"MISSION COMPLETED"
520 STOP
530 PRINT AT 10,10: INK 3; FLASH 1;"SQUADRON DESTROYED"
540 STOP
600 REM BOMBING SOUND
610 FOR n=50 TO 29 STEP -.5
620 BEEP .05,n
630 NEXT n
640 FOR x=1 TO 15
650 BEEP .05,-25: BEEP .05,-35: BEEP .05,-60
660 NEXT x
670 LET sc=sc+10
680 GO TO 260
700 REM GRAPHICS
710 DATA "a",16,24,156,255,156,24,16,0,"d",148,0,36,0,148,0,36,145,"e",0,0,120,253,255,250,120,0
720 FOR n=0 TO 0
730 READ a$
740 FOR a=0 TO 7
750 READ b: POKE LSR a$+1,b
760 NEXT a
770 NEXT n
780 RETURN

```




YOU ARE a helicopter pilot, trying to land on a ship in a stormy sea. Use cursor keys 5, 6, 7 and 8 to land on the deck. Beware, though, the ship finds it difficult to maintain its position for long and is apt to move as you are descending on it. When you have made a successful landing your time will be displayed.

Sea Landing was written for the 16K Spectrum by Georgea Saunders of Stockport, Cheshire.

SEA LANDING

```

1 REM By Georgea Saunders
5 BORDER 7: INK 0: PAPER 5: C
LS
6 GO SUB 6000
10 BORDER 0: PAPER 5: INK 0: C
LS: FOR n=11 TO 21: PRINT INK 1
AT 0,0:
NEXT n
1000 LET s=0: LET h$=" ": LET
x=1: LET sub=20: LET y=10
1010 LET b=10
1020 PRINT PAPER 1: INK 7: AT 14
0: "USE THE ARROW KEYS 5,6,7,8 T
O LAND THE HELICOPTER ON THE DECK"
1100 PRINT AT x,y:h$
1101 LET s=s+1
1105 IF x=9 THEN GO SUB 5000
1110 BEEP .125,-30: PRINT AT x,y
1120 IF INKEY$="5" THEN LET y=y-
1
1130 IF INKEY$="8" THEN LET y=y+
1
1140 IF INKEY$="6" THEN LET x=x+
1
1150 IF INKEY$="7" THEN LET x=x-
1
1155 IF sub=20 THEN GO SUB 2000
1160 IF y<=1 THEN LET y=1
1165 IF y>=11 THEN LET y=11
1170 IF x>=9 THEN LET x=9
1180 IF y>=28 THEN LET y=28
1195 LET sub=sub+1
1200 GO TO 1100
2000 REM boat
2005 LET sub=0
2010 PRINT AT 10,b:" "
2019 PRINT AT 9,b:" "

```

```

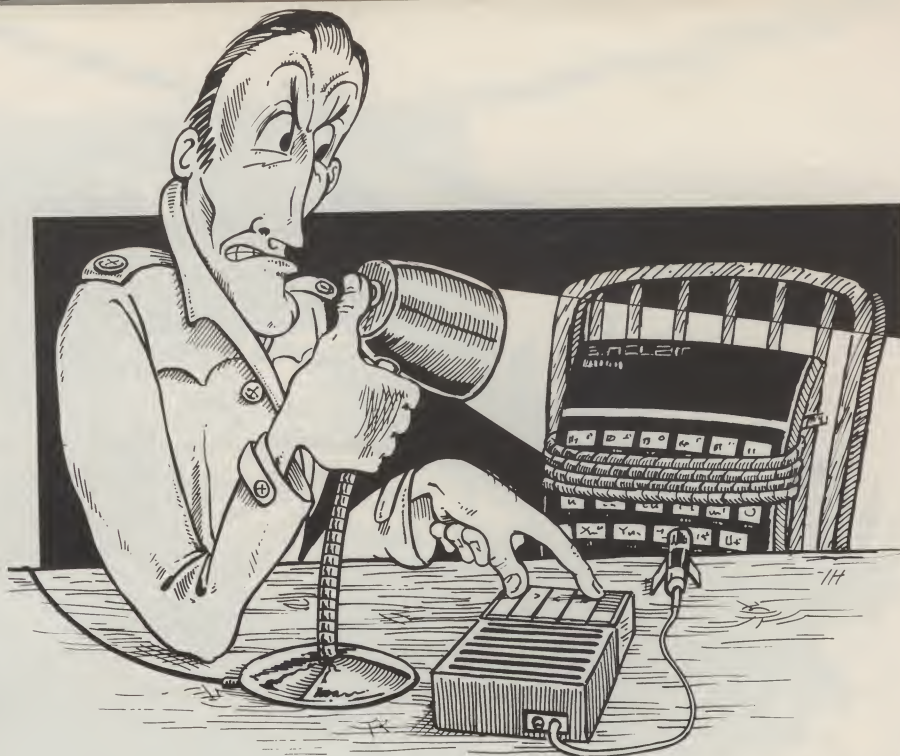
2020 LET b=INT (RND*20)+5
2045 PRINT INK 7: AT 9,b:" "
2050 PRINT INK 2: AT 10,b:" "
2060 RETURN
5000 IF ATTR (x+1,y+1)=42 THEN G
O TO 5100
5005 RETURN
5100 PRINT AT 19,1: "Time=":s
5110 PRINT AT 21,1: "Press 0 to r
un again"
5120 IF INKEY$<>"0" THEN GO TO 5
120
5130 GO TO 10
6000 REM udg
6015 POKE USR "a"+0,BIN 11111111
6020 POKE USR "a"+1,BIN 01111111
6025 POKE USR "a"+2,BIN 00111111
6030 POKE USR "a"+3,BIN 00011111
6035 POKE USR "a"+4,BIN 00001111
6040 POKE USR "a"+5,BIN 00000111
6050 POKE USR "a"+6,BIN 00000011
6115 POKE USR "b"+0,BIN 11111111
6120 POKE USR "b"+1,BIN 11111110
6125 POKE USR "b"+2,BIN 11111100
6130 POKE USR "b"+3,BIN 11111000
6135 POKE USR "b"+4,BIN 11110000
6140 POKE USR "b"+5,BIN 11100000
6145 POKE USR "b"+6,BIN 11000000
6150 POKE USR "b"+7,BIN 10000000
6210 POKE USR "c"+0,BIN 11111111
6215 POKE USR "c"+1,BIN 00011000
6220 POKE USR "c"+2,BIN 00111100
6225 POKE USR "c"+3,BIN 01111110
6230 POKE USR "c"+4,BIN 11111111
6235 POKE USR "c"+5,BIN 11111111
6240 POKE USR "c"+6,BIN 00011000
6245 POKE USR "c"+7,BIN 00011000
6300 RETURN

```


THIS PROGRAM will tell you how much memory any one of your programs uses. It tells you how much memory your machine has, how much memory your program uses, how much memory the variables use, and how much memory is spare. Amounts are given in bytes. To translate figures from bytes to Ks, divide by 1,024.

To use the program enter the program to be measured and then type-in the memory program. Type "RUN 9996" and the necessary information will be displayed.

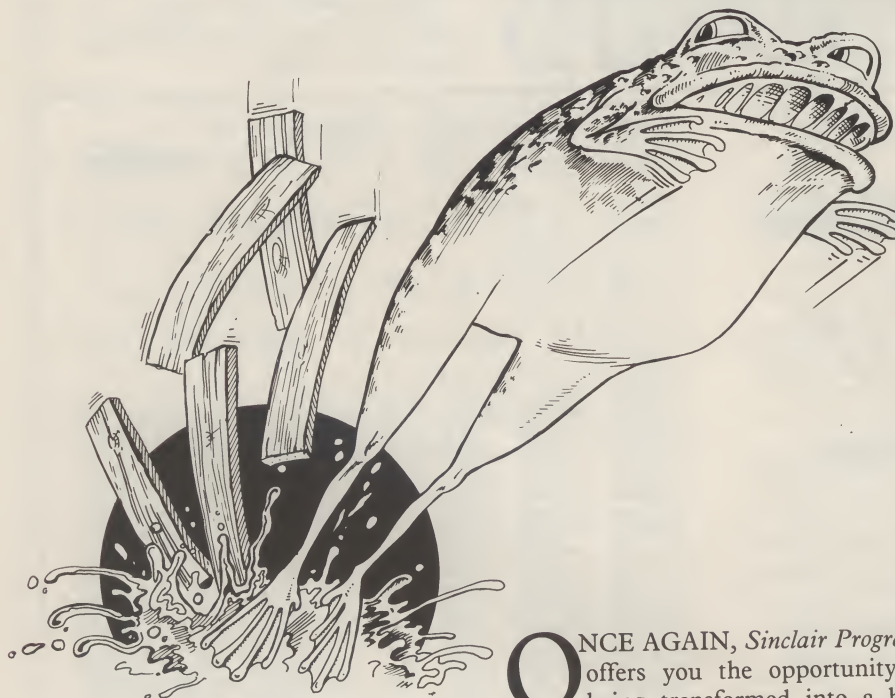
The program was written for the ZX-81 by T R Carey of Southampton, Hampshire and is most suitable for use on the 16K machine.



MEMORY PROGRAM

```
9996 PRINT TAB 8;"ZX81 MEMORY",,
,"TOTAL RAM",((PEEK 16388+256*PEEK
EK 16389)-16384)/1024," K"
9997 PRINT ,,"BASIC PROGRAM", (PEEK
EK 16396+256*PEEK 16397)-16509,"
BYTES"
```

```
9998 PRINT ,,"VARIABLES", (PEEK 1
6404+256*PEEK 16405)-(PEEK 16400
+256*PEEK 16401)-1," BYTES"
9999 PRINT ,,"SPARE MEMORY", (PEEK
K 16388+256*PEEK 16389)-(PEEK 16
404+256*PEEK 16405)," BYTES"
```



PLANKS

ONCE AGAIN, *Sinclair Programs* offers you the opportunity of being transformed into a hapless frog with no chance of survival. You, the inverse quotation mark, stand at the bottom of the screen while your malevolent computer throws planks at you.

Your only chance of prolonging your

life is to use the cursor keys 5 and 8 to dodge left and right, so that when the plank reaches the ground you are situated safely under a knot-hole. How long can you survive?

The program was written for the 1K ZX-81 by Simon Knight of Hemel Hempstead, Herts.

```
1 LET Z=10
2 LET A=20
3 LET X=INT (RND*14)+1
10 FOR N=1 TO A
15 PRINT AT A,Z-1,"(SP:1)"SP)"
20 PRINT AT N,0,"(15*9f)"
25 PRINT AT N-1,0,"
"
40 PRINT AT N,X," "
50 LET Z=Z+(INKEY#="8" AND Z<1
4)-(INKEY#="5")
60 NEXT N
70 IF Z<>X THEN GOTO 500
90 IF A=7 THEN PRINT "YOU WON"
95 LET A=A-1
100 GOTO 5
500 PRINT AT A,Z-2,"SPLAT"
510 PRINT AT 10,15,A
```




MOON SHOT

LOOKING into the sky you see a remarkably familiar figure flying across the Moon on a bicycle. You raise your gun and, by pressing "F", you fire. If you are successful the cuddly alien will fall to the ground and you catch it in your basket, using keys 5 and 8.

Can you catch all the aliens and have the Moon men declared extinct? Can you eat your dinner after playing this game, which was devised for the 16K Spectrum by Jonathon Baird of Northwich, Cheshire?

The bicycle on lines 360, 130 and 3630 is made up of graphic "A" and graphic "B". The spot on lines 50, 120 and 3630 is graphic "C" followed by graphic "D".

```

10 BORDER 0: PAPER 0: INK 7
15 GO SUB 9000
20 CLS
25 GO SUB 1000
26 GO TO 8000
30 LET z=12
40 FOR b=8 TO 15
50 PRINT AT z,b; INVERSE 1;;"
60 PRINT AT z+1,b; INVERSE 1;;"
70 FOR x=1 TO 50
75 NEXT x
80 PRINT AT z,b; INVERSE 1;"
90 PRINT AT z+1,b; INVERSE 1;;"
95 LET z=z-1
96 IF INKEY$="f" THEN GO SUB 2
100 NEXT b
105 IF INKEY$="f" THEN GO SUB 2
110 FOR b=15 TO 22
120 PRINT AT z,b; INVERSE 1;;"
130 PRINT AT z+1,b; INVERSE 1;;"
140 FOR x=1 TO 50
145 NEXT x
150 PRINT AT z,b; INVERSE 1;"
160 PRINT AT z+1,b; INVERSE 1;;"
170 LET z=z+1
180 IF INKEY$="f" THEN GO SUB 2
200 NEXT b
210 RETURN
1000 FOR a=1 TO 80
1010 INK 7: CIRCLE 128,68,a
1020 NEXT a
1030 RETURN
2000 LET r=1
2010 LET d=30
2030 FOR s=16 TO 4 STEP -1
2035 INVERSE 1
2040 PRINT AT s,r;" / ";AT s,d;" \"
2045 PAUSE 2
2049 INVERSE 0
2050 PRINT AT s,r;" ■ ";AT s,d;" ■ "
2051 IF s>13 THEN PRINT AT s,r;"
";AT s,d;" "
2055 LET r=r+1
2060 LET d=d-1
2070 BEEP .1,s
2080 NEXT s
2090 IF b=15 AND z=4 THEN GO TO
3500
3000 RETURN
3500 RESTORE 9900
3510 LET score=score+1
3520 FOR k=1 TO 11
3530 READ beep
3540 BEEP .2,beep+16
3550 NEXT k
3560 LET catch=16
3590 NEXT k
3600 LET fall=INT (RND*3)+13
3610 FOR g=4 TO 20
3620 LET catch=catch-(INKEY$="5"
)+(INKEY$="8")
3630 PRINT AT g,fall; INVERSE 1;
";AT g+1,fall;" ♂ ";AT 21,catc
h; INVERSE 0;" ■ ";
3640 PRINT AT g,fall;" ■ ";AT g+1
,fall;" ■ ";AT 21,catch;" "
3650 NEXT g
3660 IF catch=fall THEN LET scor
e=score+10
3670 PRINT AT 21,0;"
3700 RETURN
8000 LET score=0: LET et=0
8020 FOR e=1 TO 25
8030 PRINT AT 0,0;"Score=";score
;" No. of Moon Men=";et
8040 GO SUB 30
8050 LET et=et+1
8070 IF score>=90 THEN PRINT AT
21,0; FLASH 1;"Moon Men extinct
!": STOP
8100 NEXT e
8200 PRINT AT 21,0; FLASH 1;"You
failed.The Moon Men live!": STO
P
9000 FOR v=1 TO 4: READ a$: FOR
w=0 TO 7: READ c: POKE USA a$+w,
c: NEXT w: NEXT v: RETURN
9100 DATA " ",3,3,7,8,20,35,20,8
9110 DATA " ",0,0,192,64,160,16,
160,64
9115 DATA " ",0,0,0,0,0,0,0,1
9120 DATA " ",0,0,0,0,112,112,11
2,128
9900 DATA 3,3,3,3,6,4,4,3,3,1,3

```


M

MATRIX is one of those rare but excellent routines in which the computer answers back. It is a game of strategy requiring you to move a flashing cursor across a matrix of numbers, collecting the highest available values by hitting the 0 key.

The restrictions are that you can move only horizontally and that you must avoid giving the computer, which moves vertically, any access to the high numbers. The winner is the player with the highest score when more moves are impossible. Instructions and prompts are contained within the game and a running score is kept.

The computer plays very well, obviously in its element with the requisite number-crunching, and in our tests it managed to win more often than not.

An interesting and original listing from T J Marrow of Wirral, Merseyside.

In our listing, lower-case letters signify inverse video except when inside brackets, when they are graphic instructions. (16K ZX-81)

```

1 PRINT AT 10,10;"(inverse MA
TRIX)"
7 PRINT AT 17,8;"BY JAMES MAR
ROW"
8 PRINT AT 20,4;"DO YOU WANT
INSTRUCTIONS?"
9 INPUT U$
10 IF U$(1)="Y" THEN GOTO 2000
11 CLS
12 PRINT AT 10,5;"WHO AM I PLA
"YING WITH?"
13 PRINT AT 13,7;"(INPUT YOUR
NAME)"
14 INPUT N$
15 CLS
16 IF LEN N$<9 THEN GOTO 19
17 PRINT AT 13,3;"YOUR NAME IS
TOO LONG."
18 GOTO 14
19 PRINT AT 10,2;"EXCUSE ME WH
ILE I SET UP",TAB 6;"THE BOARD,
",N$
20 REM shuffle board pieces
21 LET LP=0

```


A T R I X

```

22 LET MO=2
25 DIM B$(8,16)
30 LET A$="*151009090908080807
070706060605050504040403030202
020101010000000000-1-1-1-2-2-2-3
-3-3-4-4-4-5-5-5-6-6-6-7-7-7-8-8
-8-9-9-9-900  "
40 FOR N=1 TO 8
50 FOR M=1 TO 8
60 LET A=INT ((RND*((LEN A$-1)
/2))+1)*2
70 LET B$(N,M*2-1 TO M*2)=A$(A
TO A+1)
80 IF A$(A TO A+1)="  " THEN G
OSUB 1500
90 LET A$=A$(1 TO A-1)+A$(A+2
TO LEN A$)
100 NEXT M
110 NEXT N
120 REM  score variables
130 LET S=0
140 LET T=0
160 GOSUB 700
170 REM  Players move
175 GOSUB 3000
180 PRINT AT 2*Y,1+(X-1)*3;"(tw
o inverse 'ASTERISKS)"
190 PRINT AT 2*Y,1+(X-1)*3;B$(Y
,2*X-1 TO 2*X)
200 IF INKEY$="" THEN GOTO 180
210 LET A$=INKEY$
213 IF A$="U" THEN GOTO 920
215 IF A$<>"8" AND A$<>"5" AND
A$<>"0" THEN GOTO 180
219 IF A$="0" AND B$(Y,2*X-1 TO
2*X)="  " THEN GOTO 180
220 IF A$="0" THEN GOTO 270
230 LET X=X+(A$="8")-(A$="5")
240 IF X>8 THEN LET X=1
250 IF X<1 THEN LET X=8
260 IF B$(Y,2*X-1)="  " THEN GOT
O 230
265 GOTO 180
270 LET LP=VAL B$(Y,2*X-1 TO 2*
X)
275 PRINT AT 2*Y,1+(X-1)*3;"  "
280 LET S=S+LP
290 LET MO=1
295 LET B$(Y,2*X-1 TO 2*X)="  "
297 GOSUB 765
300 REM  computers move
301 GOSUB 4000
305 DIM R(8)
310 FOR N=1 TO 8
315 LET V=-100
325 IF N=Y THEN GOTO 430
330 IF B$(N,2*X-1 TO 2*X)<>"  "
THEN GOTO 360
340 LET W=-100
345 IF N=Y THEN GOTO 420
350 GOTO 370
360 LET W=VAL B$(N,2*X-1 TO 2*X
)
370 FOR M=1 TO 8
370 FOR M=1 TO 8
380 IF M=X THEN GOTO 410
390 IF B$(N,M*2-1 TO M*2)="  "
THEN GOTO 410
395 IF VAL B$(N,M*2-1 TO M*2)<V
THEN GOTO 410
400 LET V=VAL B$(N,M*2-1 TO M*2
)
410 NEXT M
420 LET R(N)=W-V
430 NEXT N
440 LET V=-100
450 FOR N=1 TO 8
460 IF B$(N,2*X-1 TO 2*X)="  "
THEN GOTO 489
470 IF R(N)<V THEN GOTO 489
475 LET V=R(N)
480 LET Y=N
489 NEXT N
490 LET LP=VAL B$(Y,2*X-1 TO 2*
X)
500 LET T=T+LP
505 PRINT AT Y*2,1+(X-1)*3;"  "
510 LET B$(Y,2*X-1 TO 2*X)="  "
520 LET MO=2
530 GOSUB 765
540 GOTO 170
699 REM  draw board
700 CLS
701 PRINT AT 0,0;"(nine inverse
SPACES;inverse MATRIX;ten inver
se SPACES)"
706 FOR N=1 TO 8
710 PRINT AT (2*N)-1,0;"(twenty

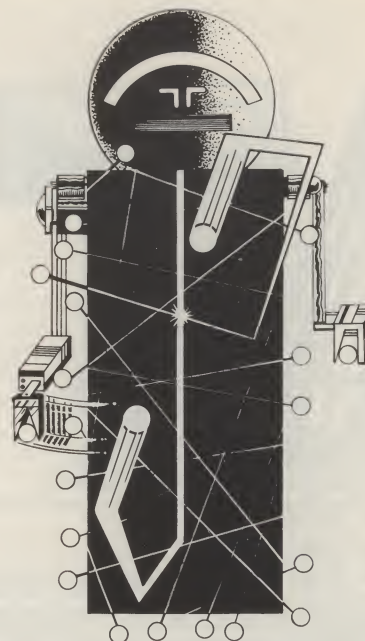
```



```

five inverse SPACEs)"
720 FOR M=1 TO 8
730 PRINT AT 2*N,(M-1)*3;"(inve
rse SPACE)" ; B$(N,2*M-1 TO 2*M)
740 NEXT M
745 PRINT AT 2*N,24;"(inverse S
PACE)"
750 NEXT N
760 PRINT AT 17,0;"(twenty five
inverse SPACEs)"
770 PRINT AT 19,2;N$;" : ";S;"
"
780 PRINT AT 21,2;"ZX81 : ";T;"
"
790 PRINT AT 19,15;"LAST PIECE
: ";LP;" "
795 PRINT AT 21,14;"
"
800 IF MO=1 THEN PRINT AT 21,14
,"MY TURN"
810 IF MO=2 THEN PRINT AT 21,14
,"YOUR TURN," ; N$
820 RETURN
910 REM   game over
920 CLS
925 PRINT AT 4,8;"(thirteen inv
erse ASTERISKs)"
930 PRINT AT 5,8;"(inverse ASTE
RISK SPACE GAME OVER SPACE ASTE
RISK)"
935 PRINT AT 6,8;"(thirteen inv
erse ASTERISKs)"
940 PRINT AT 9,7;"MY SCORE IS "
;T
950 PRINT AT 11,2;"YOUR SCORE,"
;N$;" , IS ";S
955 PRINT AT 13,7;"PRESS ANY KE
Y"
960 IF SK>T THEN GOTO 1000
970 PRINT AT 17,6;"(inverse DRA
W)"
980 IF INKEY$="" THEN GOTO 990
995 GOTO 1200
1000 IF S>T THEN GOTO 1050
1010 PRINT AT 17,9;"(inverse I W
ON)"
1020 IF INKEY$="" THEN GOTO 1020
1030 GOTO 1200
1055 PRINT AT 17,6;"(inverse YOU
WON)"
1070 IF INKEY$="" THEN GOTO 1070
1200 CLS
1210 PRINT AT 10,3;"DO YOU WANT
ANOTHER GAME?"
1220 INPUT U$
1230 CLS
1240 IF U$(1)="Y" THEN RUN
1250 PRINT AT 10,11;"THANK YOU"
1260 STOP
1500 LET Y=N
1510 LET X=M
1520 RETURN
2000 CLS
2001 PRINT AT 1,12;"(inverse MAT
RIX)";TAB 11;"-----"

```



```

2005 PRINT AT 4,1;"YOUR AIM IS T
O GAIN MORE POINTS"
2010 PRINT "THAN THE COMPUTER. W
HEN IT IS"
2015 PRINT AT 6,0;"YOUR TURN, YO
U MOVE THE ""(two inverse ASTERI
SKS)"" WITH"
2020 PRINT "THE ""8"" AND ""5""
KEYS UNTIL IT IS"
2025 PRINT "OVER THE PIECE YOU W
ANT, THEN"
2030 PRINT AT 9,0;"YOU PRESS ""0
"" TO TAKE IT."
2035 PRINT "PRESS ""U"" TO STOP
THE GAME."
2040 PRINT AT 12,1;"THE COMPUTER
MOVES VERTICALLY,"
2050 PRINT " AND YOU MOVE HORIZ
ONTALLY."
2055 PRINT AT 18,5;"WHO AM I PLA
YING WITH?"
2060 PRINT AT 20,7;"(INPUT YOUR
NAME)"
2070 INPUT N$
2075 CLS
2080 IF LEN N$<9 THEN GOTO 19
2090 PRINT AT 13,7;"YOUR NAME IS
TOO LONG"
2100 GOTO 2070
2999 REM is game over!
3000 IF B$(Y)="(sixteen SPACEs)"
THEN GOTO 920
3010 RETURN
4000 LET C$=""
4005 FOR N=1 TO 8
4010 LET C$=C$+B$(N,X*2-1 TO X*2
)
4020 NEXT N
4030 IF C$="(sixteen SPACEs)" TH
EN GOTO 920
4040 RETURN
5000 REM MATRIX
5010 SAVE "MATRIX"
5020 RUN

```


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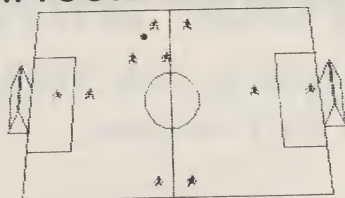
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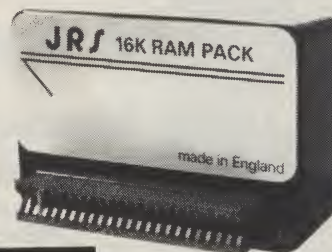
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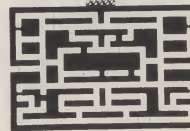
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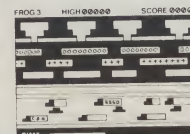
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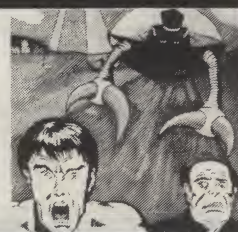
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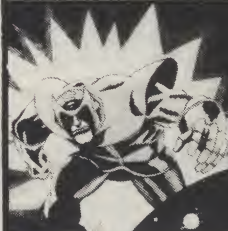
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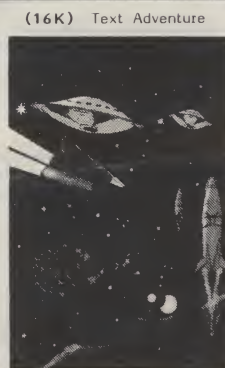
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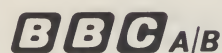
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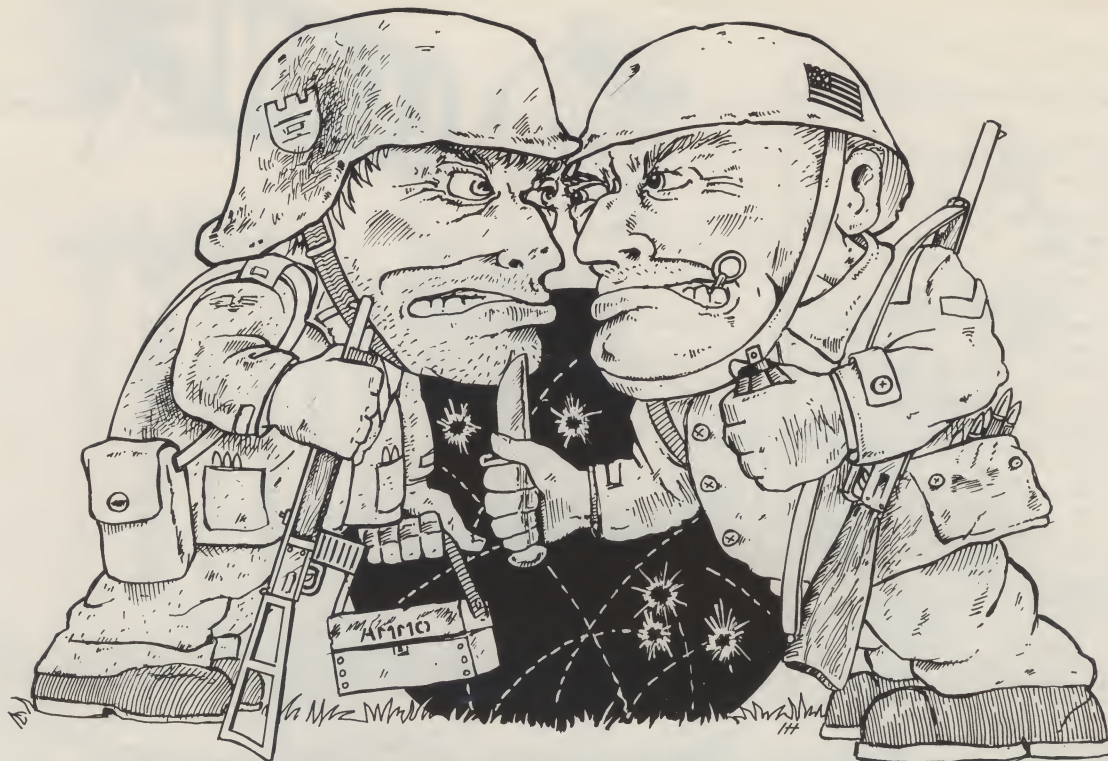
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DEPLOYMENT STRATEGY is a game of tactics and cunning which was sent by Jerome Lasowski of London SE6 for use on the 16K ZX-81.

The enemy's regiments are lined-up on the battlefield at the left of the screen. Your less-willing soldiers arrive, a regiment at a time and, by keying-in a

letter between A and J, you position them on the front line where they fight against the equivalent enemy force and the stronger wins a point.

The victorious regiment then moves to the right of the screen, where it takes position for the next battle.

As a further test of your skill you must estimate before each battle how

many fights your troops will win. A correct answer earns three bonus points, an incorrect one means you lose three points.

The war ends when either you or your enemy has a lead of 10 or more points at the end of a battle.

Lower-case letters in brackets are graphics instructions.

```

5 DIM A(44)
10 DIM A$(2,9)
15 LET A$(1)="<nine graphic Hs
>"
20 LET A$(2)="<ten inverse SPA
CE>"
25 RAND 0
30 FAST
40 CLS
50 LET A(41)=A(41)+1
60 PRINT AT 0,6;"DEPLOYMENT ST
RATEGY",,TAB 27;"NEXT",TAB 9;"B
ATTLE ",A(41),TAB 26;"BATTLE"
70 LET B$="THE ENEMY"
80 LET A(43)=0
90 LET A(44)=0
95 FOR P=9 TO 40
100 PRINT AT 15,P-9;".",AT 19,P
-9;". "
105 NEXT P
110 GOSUB 600
120 LET I=1
130 GOSUB 800
140 LET I=21
150 GOSUB 800
155 SLOW
160 PRINT AT 21,2;"YOUR ESTIMAT
E PLEASE, GENERAL"
170 INPUT EST
180 IF EST<0 OR EST>10 THEN GOT
O 170
190 PRINT AT 17,4;"ESTIM ",JEST
200 FOR J=21 TO 30
210 PRINT AT 21,2;"
"
220 LET P=J
230 IF A(P)<>0 THEN GOTO 320

```

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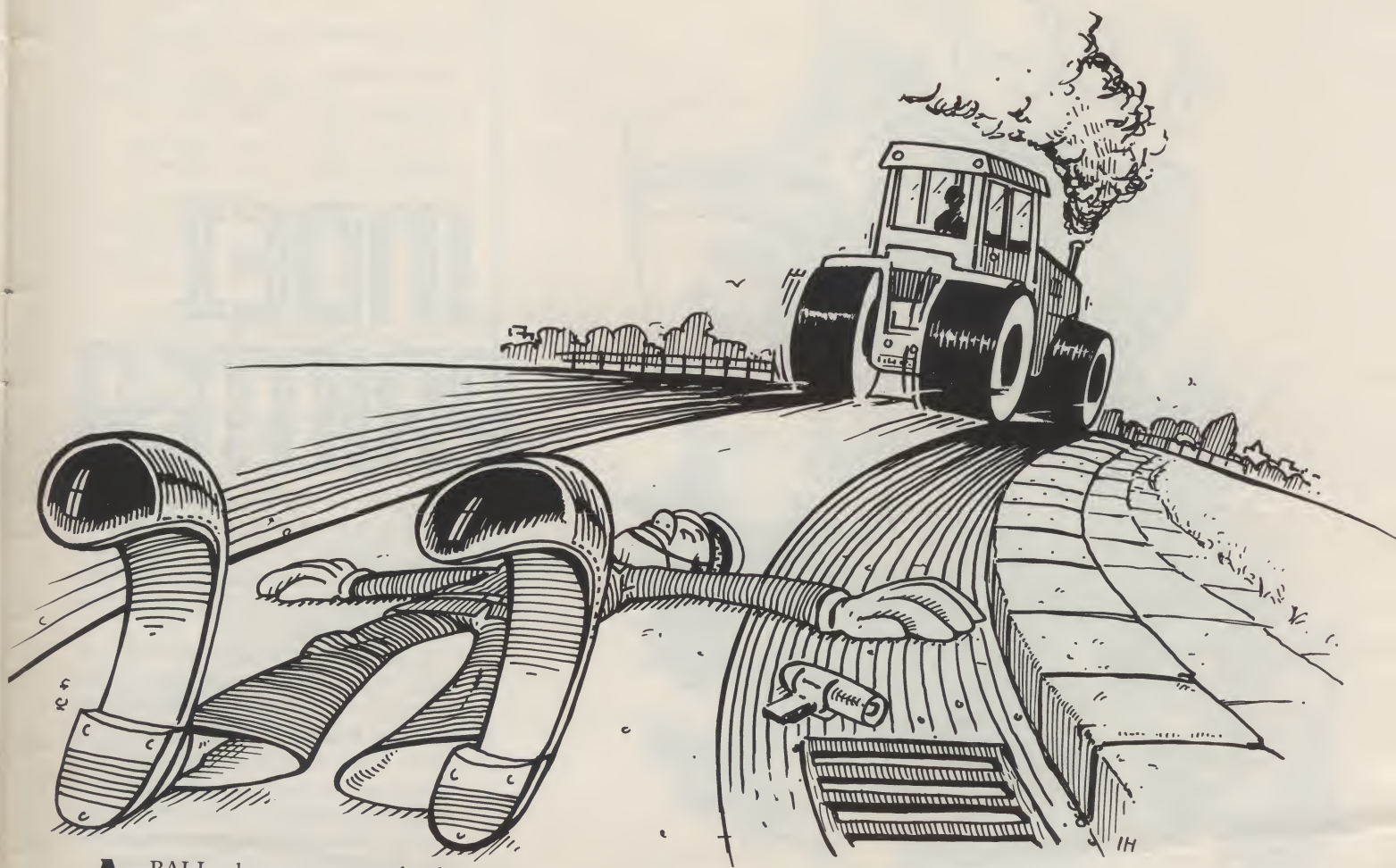
240 LET VAL=INT (RND*10)
250 PRINT AT 21,2;"REINFORCEMEN
TS: ",A$(1,1 TO VAL),VAL
260 INPUT P$
270 LET P=CODE P$-17
280 IF P<21 OR P>30 THEN GOTO 2
60
290 IF A(P-20)=0 THEN GOTO 260
300 LET A(P)=VAL
310 GOSUB 1000
320 IF A(P)=A(P-20) THEN GOTO 4
00
330 LET H=0
340 IF A(P)>A(P-20) THEN LET H=
1
350 LET A(43)=A(43)+H
360 LET A(44)=A(44)+1-H
370 PRINT AT 4+A(44-H),27+4*H;"C
HR# (A(P+(H-1)*20)+28-128*(H-1))
380 LET A(A(44-H)+10+H*20)=A(P+
(H-1)*20)
390 GOSUB 600
400 PRINT AT P-16,13;" "
410 LET A(P-20)=0
420 LET A(P)=0
430 NEXT J
440 LET H=-1
450 IF A(43)=EST THEN LET H=2
460 PRINT AT 21,2;"LOSE 3 POINT
S FOR ESTIMATE"
470 IF A(43)=EST THEN PRINT AT
21,2;"GAIN"
480 FOR J=1 TO 40
490 NEXT J
500 GOSUB 600
510 IF ABS A(42)<10 THEN GOTO 3
0

```

```

520 PRINT AT 21,2;"END OF WAR -
YOU LOSE "
530 IF A(42)>0 THEN PRINT AT 21
,19;"WIN "
540 STOP
550 IF P>35 THEN GOTO 630
610 LET A(42)=A(42)+2*H-1
620 PRINT AT 18,4;"GAINS ",A(43
)
630 LET NME=(ABS A(42)-A(42))/2
640 LET YOU=(ABS A(42)+A(42))/2
650 PRINT AT 16,18;"SCORE",TAB
20;"ENEMY ",NME,TAB 20;"YOU "
,YOU,
660 RETURN
800 FOR P=I TO I+9
810 IF A(P+10)=0 AND P>20 THEN
RETURN
820 IF A(P+10)=0 THEN LET A(P+1
0)=INT (RND*8+2)
830 LET A(P)=A(P+10)
840 LET A(P+10)=0
850 GOSUB 1000
860 NEXT P
870 RETURN
1000 IF I=1 THEN PRINT AT P+4,0;
B$(P);".",TAB 13;CHR$(P+37);TAB
25;".",TAB 29;CHR$(P+37)
1010 PRINT AT P-I+5,13+SGN (I-5)
*(A(P)+2),A(P)
1020 IF I=21 THEN PRINT AT P-16,
14;" "
1030 PRINT A$(1+(21-I)/20,1 TO A
(P))
1040 RETURN

```

A BALL bounces around the screen and you must trap it using as few blocks as possible. Pressing any letter will place a block behind the ball. Once one ball has been trapped another will appear.

This program was written for the 16K ZX-81 by Roland Waddilove of Widnes, Cheshire.

SPEED TRAP

```
100 REM      instructions
110 POKE 16418,0
120 PRINT TAB 10;"SPEED-TRAP",T
AB 9;"(12*97)"
130 PRINT "," THE IDEA OF THE G
AME IS TO TRAP THE BALL. PRESSING
ANY LETTER WILL PLACE A BLOCK
JUST BEHIND THE BALL."
140 PRINT "," THERE ARE 20 BALL
S ALTOGETHER, USE AS FEW BLOCKS
AS POSSIBLE."
150 PRINT AT 21,7;"Press a lett
er."
160 IF INKEY$="" THEN GOTO 160
170 CLS
200 REM START
210 LET BEST=100
220 LET BALL=1
230 LET BLOCKS=0
240 LET X=1
250 GOSUB 700
260 LET P=INT (RND*700)+PEEK 16
396+256*PEEK 16397
270 IF PEEK P OR PEEK (P+X) THE
N GOTO 260
300 REM GAME
310 POKE P,0
320 IF INKEY$<">" THEN LET BLOC
KS=BLOCKS+1
```

```
330 IF INKEY$<">" THEN POKE P,8
340 LET P=P+X
350 POKE P,23
360 IF NOT PEEK (P+X) THEN GOTO
310
370 IF RND>.5 THEN GOTO 425
400 REM CHANGE DIRECTION
405 LET X=33
410 IF NOT PEEK (P+X) THEN GOTO
310
415 LET X=1
420 IF NOT PEEK (P+X) THEN GOTO
310
425 LET X=-33
430 IF NOT PEEK (P+X) THEN GOTO
310
435 LET X=-1
440 IF NOT PEEK (P+X) THEN GOTO
310
445 LET X=33
450 IF NOT PEEK (P+X) THEN GOTO
310
455 LET X=1
460 IF NOT PEEK (P+X) THEN GOTO
310
500 REM NEW BALL
510 LET BALL=BALL+1
520 PRINT AT 0,8;BLOCKS,AT 0,20
;(BALL AND BALL<21)
```

```
530 IF BALL<=20 THEN GOTO 260
600 REM GAME OVER
610 IF BEST>BLOCKS THEN LET BES
T=BLOCKS
620 PRINT AT 23,6;BEST
630 FOR N=0 TO 100
640 NEXT N
650 PRINT AT 23,10;"Press P to
play again"
660 IF INKEY$="" THEN GOTO 660
670 IF INKEY$="P" THEN GOTO 220
680 CLS
690 STOP
700 REM BORDER
710 CLS
720 PRINT " blocks=
ball= "
730 FOR N=1 TO 22
740 PRINT "(isp)",TAB 31;"(isp)
"
750 NEXT N
760 PRINT " best=
"
770 PRINT AT 0,8;BLOCKS,AT 0,20
;BALL,AT 23,6;BEST
780 RETURN
800 REM save
810 SAVE "SPEED-TRAP"
820 RUN
```




INDEX PRINTER

FOR THOSE who possess a printer and a 16K Spectrum, Michael Thomas of Warley, West Midlands, has written a program to produce index cards for the programs you have recorded on tape.

Loading instructions and the program name are shown in double-sized characters. Also printed are the cassette type and length and space is left for up to 14 lines of other information. The completed card can be folded to give a professional finish to your cassette case.

The underlined letters in line 1200 should be entered in graphics mode.

```

1000 DATA "a",120,132,124,3,3,12
4,132,120
1010 DATA "b",3,12,48,192,192,48
,12,3
1020 DATA "c",192,48,12,3,3,12,4
8,192
1030 DATA "d",30,33,62,192,192,6
2,33,30
1040 DATA "f",255,0,0,0,0,0,0
1050 FOR i=1 TO 5
1060 READ a$
1070 FOR j=0 TO 7
1080 READ b
1090 POKE USR a$+j,b
1100 NEXT j: NEXT i
1200 LET a$="AB"          Cut Her
e
1210 DIM b$(16,32)
4999 REM *****
5000 REM *****
5001 REM *****
5010 CLS : PRINT AT 10,6;"ENTER
THE TAPE TITLE"
5020 INPUT "Maximum 16 Character
s ";t$: IF t$="" THEN GO TO 5020
5030 IF LEN t$>16 THEN GO TO 501
0
5040 CLS : PRINT AT 10,3;"ENTER
LOADING INSTRUCTIONS"
5050 INPUT "Maximum 12 Character
s ";l$: IF l$="" THEN GO TO 5050
5060 IF LEN l$>12 THEN LET l$=l$
(1 TO 12)
5070 CLS : PRINT AT 10,5;"ENTER
TYPE OF CASSETTE"
5080 INPUT "Maximum 20 Character
s ";u$: IF u$="" THEN GO TO 5080
5090 IF LEN u$>20 THEN GO TO 507
0
5100 CLS : PRINT AT 10,5;"ENTER
LENGTH OF CASSETTE"

```

```

5110 INPUT v
5120 FOR i=4 TO 17
5130 CLS : PRINT AT 10,6;"ENTER
TEXT FOR LINE ";i
5140 INPUT "
";i$
5150 IF LEN i$<=32 THEN LET b$(i
)<(16-LEN i$)/2 TO >=i$: GO TO 521
0
5160 LET c=0
5165 IF c=32 THEN GO TO 5195
5170 LET j$=i$(33-c)
5175 IF i$(33-c)=" " THEN GO TO
5200
5180 LET c=c+1
5185 GO TO 5165
5195 LET c=0
5200 LET b$(i)=i$( TO 32-c)
5205 LET b$(i+1)<(16-LEN i$(33-c
TO >)/2 TO >=i$(33-c TO )
5207 LET i=i+1
5210 NEXT i
5999 REM *****
6000 REM **PRINTING**
6001 REM *****
6010 LPRINT ""a$
6020 FOR i=0 TO 31
6030 LPRINT TAB i;"_";
6040 NEXT i
6050 CLS
6060 LET x=128: LET y=157: LET y
$=t$
6070 GO SUB 9000
6080 FOR i=4 TO 18
6090 PRINT AT i,0;b$(i)
6100 NEXT i
6110 LET x=144: LET y=9: LET y$=
CHR$ 34+l$+CHR$ 34
6120 GO SUB 9000
6130 PRINT AT 20,14-LEN y$;"LOAD
"

```

```

6140 COPY
6150 CLS : FOR i=0 TO 31
6160 PRINT AT 0,i;"F"
6170 NEXT i

6180 LET x=128: LET y=157: LET y
$=t$
6190 GO SUB 9000
6200 FOR i=0 TO 31
6210 PRINT OVER i;AT 2,i;"_"
6220 NEXT i: OVER 0
6230 PRINT ""TAB 3;u$+" Cassette
"
6240 PRINT ""TAB 3;"C";j$ (2*);
v/2;"mins)"
6250 FOR i=0 TO 31
6260 PRINT AT 10,i;"_"
6270 NEXT i
6280 PRINT a$
6290 COPY
6300 CLS : PRINT AT 10,6;"INDEX
CARD FINISHED""TAB 2;"PRESS PAP
ER FEED & TEAR OFF"
8999 STOP
9000 PRINT AT 21,0;y$
9010 FOR a=7 TO 0 STEP -1
9020 FOR b=0 TO 8*LEN y$-1

9030 IF POINT (b,a)=0 THEN GO TO
9090
9040 FOR c=0 TO 1
9050 FOR d=0 TO 1
9060 PLOT x-(8*LEN y$)+2*b+c,y+2
*a-d
9070 NEXT d
9080 NEXT c
9090 NEXT b
9100 NEXT a
9110 PRINT AT 21,0;" "
9120 RETURN

```



```

1 LET st=40
2 LET M=0
3 LET F=0
10 DATA 60,24,24,255,24,36,36,
102
20 FOR A=0 TO 7: READ B: POKE
USR "A"+A,B: NEXT A
30 PRINT INK 1;"TRY AND ESCAPE
"
40 PRINT INK 2;"FROM THE -'S"
50 PRINT INK 3;"WHILE SEARCHIN
G"
60 PRINT INK 4;"FOR "; INK 6;"
GOLD "
65 FOR A=1 TO 60: BEEP .01,A:
NEXT A
80 PRINT AT 21,5;"PRESS ANY KE
Y"
90 PAUSE 0: CLS
100 PRINT AT 0,5;"CONTROLS:"
110 PRINT AT 3,5;"5=LEFT"
120 PRINT AT 4,5;"8=RIGHT"

```

```

130 PRINT AT 5,5;"6=DOWN"
140 PRINT AT 6,5;"7=UP"
180 PRINT AT 7,5;"Q=QUIT"
190 PRINT AT 21,6;"PRESS ANY KE
Y": PAUSE 0: CLS
195 FOR A=0 TO 31: PRINT AT 0,A
,"-" AT 14,A,"-" : NEXT A
200 FOR A=1 TO 14: PRINT AT A,0
,"-" AT A,31,"-" : NEXT A: PRINT
AT 14,INT (RND*29)," "
211 LET A=10: LET B=10
220 LET C=INT (RND*13)+1
230 LET D=INT (RND*29)+1
235 IF C=A AND D=B THEN GO TO 2
11
240 PRINT AT A,B;"a"
250 PRINT AT C,D;"b"
260 LET A$=INKEY$
261 IF st=0 THEN PRINT "YOU ARE
DEAD " : GO TO 1230
262 IF A=21 AND F>999 THEN PRIN
T "WELL DONE YOU HAVE ESCAPED":
FOR A=64 TO 1: BEEP .1,A: NEXT A
: RUN
263 IF A=21 AND F<1000 THEN PRIN
T "YOU DONT HAVE ENOUGH GOLD":
STOP
264 PRINT AT 20,0:F
265 IF A$="Q" OR A$="q" THEN GO
TO 1200
270 IF A$="5" THEN GO TO 400
280 IF A$="8" THEN GO TO 500
290 IF A$="6" THEN GO TO 600
300 IF A$="7" THEN GO TO 700
350 GO TO 260
410 IF SCREEN# (A,B-1)<>" " THE
N PRINT AT 21,0;"OUCH": BEEP .5,
-10: PRINT AT 21,0," " : LET s
t=st-1: GO TO 350
420 PRINT AT A,B," "

```

```

430 LET B=B-1
440 PRINT AT A,B;"a"
450 LET X=INT (RND*10)
460 IF X=5 THEN PRINT AT 21,0:
INK 6;"GOLD": BEEP .5,-10: PRINT
AT 21,0," " : LET F=F+INT (RND*20)
470 LET M=M+1
480 GO TO 220
510 IF SCREEN# (A,B+1)<>" " THE
N PRINT AT 21,0;"OUCH": BEEP .5,
-10: PRINT AT 21,0," " : LET s
t=st-1: GO TO 350
520 PRINT AT A,B," "
530 LET B=B+1
540 PRINT AT A,B;"a"
550 LET X=INT (RND*10)
560 IF X=5 THEN PRINT AT 21,0:
INK 6;"GOLD": BEEP .5,-10: PRINT
AT 21,0," " : LET F=F+INT (RND*20)
570 LET M=M+1
580 GO TO 220
610 IF SCREEN# (A+1,B)<>" " THE
N PRINT AT 21,0;"OUCH": BEEP .5,
-10: PRINT AT 21,0," " : LET s
t=st-1: GO TO 350

```

GOLD

HURRY AROUND the cave picking-up the golden coins. The evil trolls are out to get you. Find as many coins as possible before they trap you or you run out of air.

Underlined letters should be entered

```

620 PRINT AT A,B," "
630 LET A=A+1
640 PRINT AT A,B;"a"
650 LET X=INT (RND*10)
660 IF X=5 THEN PRINT AT 21,0:
GOLD": BEEP .5,-10: PRINT AT 21,
0," " : LET F=F+INT (RND*20)
670 LET M=M+1
690 GO TO 220
710 IF SCREEN# (A-1,B)<>" " THE
N PRINT AT 21,0;"OUCH": BEEP .5,
-10: PRINT AT 21,0," " : LET s
t=st-1: GO TO 350
720 PRINT AT A,B," "
730 LET A=A-1
740 PRINT AT A,B;"a"
750 LET X=INT (RND*10)
760 IF X=5 THEN PRINT AT 21,0,"

```

```

GOLD": BEEP .5,-10: PRINT AT 21,
0," " : LET F=F+INT (RND*20)
770 LET M=M+1
780 GO TO 220
1200 INPUT "DO YOU REALLY WANT T
O QUIT?" : B$
1210 IF B$="Y" OR B$="y" THEN GO
TO 1230
1220 PRINT AT 21,0;"THEN DONT SA
Y YOU DO": PAUSE 200: PRINT AT 2
1,0," " : GO
TO 350
1230 POKE 23692,10: PRINT "YOU F
OUND " : F;" GOLD PIECES"
1240 PRINT "AND YOU LASTED " : M;"
MOVES"
1250 PAUSE 0
1260 RUN
1270 STOP

```





MOLE SEARCH

A MOLE will appear from one of the six molehills on your screen. Hit the number corresponding to that hole to gain 50 points. It is not so easy as it sounds, because the mole is wary and will disappear almost immediately.

The program was written by L Maynard of Crawley, Sussex for the 16K ZX-81.

```

10 LET A$="(99:3*isp:9w:27*sp:
isp:i":isp:i":isp:27*sp:isp:9w:9
6:99:isp:27*sp:5*isp)"
20 LET B$="(101*sp)"
30 LET P=0
40 FOR F=5 TO 24 STEP 8
50 PRINT AT F,4;"(2*isp:9w:5*9
6:99:2*isp:4*sp:2*isp:9w:5*96:99
:2*isp)"
60 NEXT F
65 LET J#=A$
70 LET A=INT (RND*6)+1
75 PRINT AT 0,13;"SCORE=";P
80 IF A=1 THEN PRINT AT 1,7;J#
90 IF A=2 THEN PRINT AT 1,22;J
#
100 IF A=3 THEN PRINT AT 9,7;J#

```

```

110 IF A=4 THEN PRINT AT 9,22;J
#
120 IF A=5 THEN PRINT AT 17,7;J
#
130 IF A=6 THEN PRINT AT 17,22;
J#
135 LET E#=CHR# (A+28)
140 IF J#=A# THEN GOTO 160
150 RETURN
160 FOR D=0 TO 20
170 IF INKEY#=E# THEN GOTO 200
180 NEXT D
185 LET J#=B#
190 GOSUB 80
195 GOTO 65
200 LET P=P+50
210 GOTO 185

```




INVERTER ROUTINE

THIS short **Inverter Routine** will change A\$ in normal video to S\$ in inverse video. It was written by Martin Winch of St Austell, Cornwall to be added to longer programs for the 16K ZX-81.

Lines 2 and 45 have been added to demonstrate the function of the routine but if it were included in a longer program the definition of A\$ and the PRINT command could be included elsewhere in the program.

```
2 LET A$="SINCLAIR PROGRAMS"
5 LET S$=""
10 FOR I=1 TO LEN A$
20 LET A=CODE A$(I)+128
30 LET S$=S$+CHR$ A
40 NEXT I
45 PRINT S$
```

```
1 REM PARANOID
10 LET Z=1
15 LET P=1
20 LET A=INT (RND*10)+10
30 LET X=10
40 PRINT AT Z,10;"(11*1sP)"
50 LET Y=13
60 FOR F=Z+2 TO 10
70 LET Y=Y+(INKEY$="8")-(INKEY$="5")
80 PRINT AT X,Y;"V"
90 PRINT AT 1-F,A;"."
100 FOR L=1 TO 1.5
110 NEXT L
120 PRINT AT 1-F,A;" "
130 PRINT AT X,Y;" "
140 NEXT F
150 IF Z>=9 THEN GOTO 220
160 IF Y=A THEN GOSUB 230
170 FOR C=1 TO 9
180 NEXT C
190 IF Y<>A THEN LET Z=Z+2
200 CLS
210 GOTO 20
220 PRINT AT 10,15;"lost"
225 GOTO 260
230 LET P=P+1
240 PRINT AT X,Y;"(iv)"
250 RETURN
260 PRINT P
```

Paranoid



PHENRY of Newcastle-on-Tyne has devised **Paranoid** for the 16K ZX-81. You are described as paranoid by the program title with good reason, because somebody at the top of the screen does not like you and is throwing missiles. If you catch them you survive for a time, but if you miss, a large black line will descend slowly from the sky and crush you.

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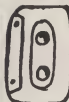
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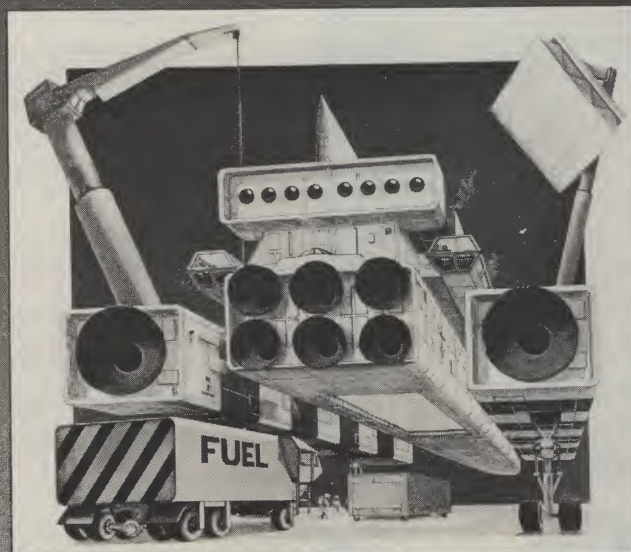
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